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Sediment Data

Manitoba

Données sur les sédiments

1990

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OTTAWA, CANADA, 1992

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PREFACE

This publication was prepared by personnel of the Sediment Survey Section, Water Survey of Canada Division, under the direction of the Director, Water Resources Branch, Department of the Environment, Ottawa.

The basic data were collected and compiled under the supervision of the Regional Chief of the Water Resources Branch at Winnipeg, Manitoba.

The co-operation received from provincial agencies and from other organizations is gratefully acknowledged.

PRÉFACE

Le groupe d'étude des sédiments de la Division des relevés hydrologiques du Canada, sous l'autorité du directeur des Ressources en eau du ministère de l'Environnement, à Ottawa, a préparé la présente publication.

Le chef régional de la Direction des ressources en eau, à Winnipeg (Manitoba), a supervisé la collecte et la compilation des données de base.

Nous remercions vivement les organismes provinciaux, ou autres, pour leur collaboration.

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INTRODUCTION

The Water Resources Branch of the Department of the Environment herein presents for the 1990 calendar year the annual suspended sediment data and a historical data summary for the sediment survey investigations conducted in Manitoba by the Water Survey of Canada.

Data on the character and quantity of fluvial sediments provided by sediment survey investigations are intended for use in studies of water quality, environmental impacts, river processes and behaviour, and engineering design.

General introductory information on the sediment survey is included in this publication. Similar information for the associated hydrometric survey is given in the regular publications containing surface water data.

Details on individual stations and related records, as well as recent data that have not yet been published, may be obtained upon application to:

Water Resources Branch,
Department of the Environment,
521 Federal Building,
269 Main Street,
Winnipeg, Manitoba.
R3C 1B2
(204 983-2435)

or to the Director, Surveys and Information Systems Branch, Department of the Environment, Ottawa, Ontario, K1A 0H3 (819 997-2098).

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INTRODUCTION

Dans la présente publication de la Direction des ressources en eau du ministère de l'Environnement, on trouvera les données annuelles sur les sédiments en suspension pour 1990 et le sommaire des données chronologiques sur les sédiments, à la suite des études effectuées dans les cours d'eau du Manitoba par la Division des relevés hydrologiques du Canada.

Les données recueillies sur la nature et l'importance de la charge solide dans les cours d'eau doivent servir aux études portant sur la qualité des eaux, les incidences environnementales, les processus fluviaux, le comportement des cours d'eau et la conception de projets.

La presente publication contient des renseignements généraux préliminaires sur les études des sédiments. Des renseignements semblables sur les études hydrométriques connexes sont contenus dans les publications régulières présentant des données sur les eaux de surface.

On peut obtenir des renseignements supplémentaires sur les stations et les relevés, ainsi que des données récentes non encore publiées, en s'adressant au:

Direction des ressources en eau
Ministère de l'Environnement
521, Édifice fédéral
269, rue Main
Winnipeg (Manitoba)
R3C 1B2
(204 983-2435)

ou au Directeur, Relevés et systemes d'information, ministère de l'Environnement, Ottawa (Ontario), K1A 0H3 (819 997-2098).

SCOPE OF PUBLICATION

Descriptive information about sediment stations is given. This refers to the Location, Latitude and Longitude, Drainage Area and whether the flow is Natural Flow or Regulated Flow (the year that regulation began is given, if known), Type of Gauge and the Total Suspended Sediment Load in Tonnes for the Period of Record is also included. International Gauging Stations are identified and the names of co-operating agencies who supply data are given; unusual conditions at the sediment station that could affect the data results are explained under "Remarks".

This publication contains data on streamflow, instantaneous suspended sediment concentration; daily mean suspended sediment concentration; daily suspended sediment loads; dissolved solids concentration; load summary; particle-size distribution of suspended sediment in percent sand, silt and clay; bed load and bed material; water temperature when samples were collected; type of sampler and the single sampling vertical location.

A historical sediment data summary includes such information as Sampled Concentration Maximum and Minimum; Suspended Sediment Load Maximum Daily and the Total for Period. The Period of Record and the Type of Operation for each year of data are also given. A Summary for the Months of record gives the Period of Record Mean, the Mean for Period of Record and the Standard Error of Mean as a percent.

HISTORY AND OBJECTIVES OF SEDIMENT SURVEYS IN CANADA

In Canada, investigations of sediment transported by streams were first undertaken by individual organizations or agencies in 1948, to meet the needs of federal and provincial agencies for assessment of particular projects. Although the investigations were extended to meet expanding needs after 1948, it was not until 1961 that a systematic survey was undertaken by the Water Resources Branch.

The sediment survey program has the following objectives:

(1) Collection and provision of data related to sediment transport in Canadian rivers for applications in water resource engineering, water quality and environmental studies.

(2) Provision of information and advice related to sediment transport.

(3) Assessment, improvement and standardization of equipment and techniques used in Canada's sediment survey program.

PUBLICATION OF SEDIMENT DATA

Sediment data have been published in a variety of formats since the beginning of the Sediment Survey Program.

PORTÉE DE LA PUBLICATION

Des données descriptives sont présentées sur les stations d'étude des sédiments. Elles concernent leur emplacement, leurs latitude et longitude, leur bassin versant, la nature de débit (naturel ou régularisé, avec indication, le cas échéant, de l'année où la régularisation a commencé, si elle est connue), le type d'instrument de mesure employé et le débit total des sédiments en suspension (en tonnes) pour la période de relevé. Les stations internationales de jaugeage sont indiquées, ainsi que le nom des organismes qui fournissent les données. Des explications concernant des conditions exceptionnelles qui ont pu influer sur les résultats sont présentées dans la partie «Remarques».

Cette publication renferme des données sur le débit des cours d'eau, les concentrations instantanées de sédiments en suspension, les concentrations journalières moyennes de sédiments en suspension, les débits journaliers de sédiments en suspension, les concentrations de matières dissoutes, les débits solides totaux (résumés), la granulométrie des sédiments en suspension exprimée en pourcentage de sable, de limon et d'argile, le charriage et les matériaux du lit, la température de l'eau au moment de l'échantillonnage, le type d'échantillonneur employé et l'emplacement des verticales de prélèvement d'échantillons uniques.

Un résumé des données historiques sur les sédiments est inclus. On y trouve divers renseignements comme les concentrations maximale et minimale mesurées, le débit journalier maximal des sédiments en suspension et le total pour la période. La période de relevé et le type d'exploitation des stations sont indiqués pour chaque année. Dans un résumé pour les mois de relevé, on donne la moyenne pour chaque période et pour l'ensemble des périodes de relevé ainsi que l'erreur-type de la moyenne, en pourcentage.

HISTORIQUE ET OBJECTIFS DES ÉTUDES DES SÉDIMENTS AU CANADA

Au Canada, les études dans ce domaine ont débuté en 1948 en réponse aux besoins exprimés par certains organismes fédéraux et provinciaux pour l'évaluation de projets donnés et étaient le fait d'organismes privés. Bien que les études se soient poursuivies après 1948 pour satisfaire aux besoins accrus, ce n'est qu'en 1961 que la Direction des ressources en eau les a entreprises de façon systématique.

Les buts de ces études sont de:

(1) réunir et produire des données sur les transports solides dans les cours d'eau canadiens, données dont on peut avoir besoin pour des études concernant l'environnement, la qualité des eaux et la conception de projets portant sur les ressources en eau.

(2) produire des informations concernant les transports solides.

(3) évaluer, améliorer et uniformiser le matériel et les techniques employés dans le programme d'étude des sédiments au Canada.

PUBLICATION DES DONNÉES SUR LES SÉDIMENTS

Depuis le début du programme d'étude des sédiments, la présentation des données a varié.

During the years 1948 to 1960, some sediment data were collected for several Prairie rivers to meet the needs of particular projects. The first Water Resources Paper series containing sediment data incorporated a selection of these data and also data for part of the year ending September 30, 1961, at stations established for the continuing program. The second issue was a biennial publication covering only the continuing program for the 1962 and 1963 water years. All subsequent editions titled *Sediment Data Canadian Rivers* have been published annually. The sediment data since 1978 have been presented entirely in the International System of Units (SI).

Commencing with 1984, the *Sediment Data* were published in a new format wherein Canada was divided into eight regions. The provinces each represent a separate region except for New Brunswick, Newfoundland, Nova Scotia and Prince Edward Island, which together form the Atlantic Provinces region, and the Yukon and Northwest Territories which make up another. The publications are identified by the province or territories covered and the year in which the data were collected. These data are published annually on a calendar-year basis and the stations are listed alphabetically.

A new edition, *Miscellaneous Sediment Data 1966 to 1983*, was published. It contains a tabulation of locations in Canada where miscellaneous data were collected but not previously published by the Water Survey of Canada. The following data are included in this one time publication: date and time of sample collection; instantaneous discharge or daily mean discharge; sampling vertical; instantaneous concentration; dissolved solids for some samples; type of sampler used; particle size distribution of suspended sediment in percent sand, silt and clay for some depth integrated samples and/or measurements, and some point integrated measurements; particle size distribution of bed load; particle size distribution of bed material; and the water temperature at time of sampling for some samples is also given where available.

The first edition of a *Sediment Data Reference Index* was published for data to 1972. It contains a tabulation of locations in Canada where sediment data were collected by the Water Survey of Canada. The index has been subdivided alphabetically by province or territory, with sediment survey stations also listed alphabetically. Commencing with the 1978 publication, data are presented in the International System of Units (SI) and will continue to be published biennially. The latest edition supersedes all previous editions because it contains any corrections or additions since the last publication.

The first edition of a new publication series titled *Historical Sediment Data Summary for Canadian Rivers* was produced for data to 1974. This publication contains a summary of historical monthly and annual mean suspended sediment load, and annual extremes of daily suspended sediment concentration and loads and total annual suspended load. Commencing with the 1978 publication, data are presented entirely in the International System of Units (SI). This publication has been discontinued, as much of the information is now included in the new annual *Sediment Data* publication.

De 1948 à 1960, on a recueilli des données pour plusieurs cours d'eau des Prairies en prévision de la réalisation de certains projets. La première publication contenant des données sur les sédiments a paru dans la série intitulée *Water Resources Paper*; elle présentait un choix de ces données ainsi que des données recueillies en 1961 avant le 30 septembre à des stations établies pour la réalisation du programme permanent. La deuxième publication a porté sur les données recueillies dans le cadre du programme au cours des années hydrologiques 1962 et 1963. Par la suite, les données ont été publiées annuellement sous le titre *Données sur les sédiments - rivières canadiennes*. Depuis 1978, les données sont exprimées en unités du Système international (SI).

En 1984, la présentation des *Données sur les sédiments* a été modifiée. Le Canada a été divisé en huit régions, une région pour chaque province, sauf le Nouveau-Brunswick, Terre-Neuve, la Nouvelle-Écosse et l'Île-du-Prince-Édouard qui, ensemble, forment la région des provinces de l'Atlantique, et les Territoires du Yukon et du Nord-Ouest, qui forment une autre région. Les publications sont nommées selon la région couverte et l'année des données (année civile). Ces publications sont annuelles. Les stations y sont présentées par ordre alphabétique.

Une édition récente intitulée *Données diverses sur les sédiments, 1966 à 1983* vient de paraître. On y présente sous forme de tableau les emplacements où des données diverses non encore publiées ont été recueillies au Canada par la Division des relevés hydrologiques. Cette première édition comprend des données telles que : la date et la durée de l'échantillonnage; le débit instantané ou débit journalier moyen; la verticale d'échantillonnage; les concentrations instantanées; les concentrations de matières solides en solution pour certains échantillons; le type d'échantillonneur employé; la granulométrie des sédiments en suspension en pourcentage de sable, de limon et d'argile, dans le cas de mesures avec intégration selon la profondeur ou d'échantillons intégrés sur toute la profondeur, et dans le cas de mesures par la méthode ponctuelle; la granulométrie du charriage; la granulométrie des matériaux du lit; la température de l'eau lors du prélèvement d'échantillons, lorsque celle-ci est connue.

Un *Index de référence des données sur les sédiments* est publié. La première édition portait sur les données disponibles jusqu'en 1972. Les emplacements où des données sur les sédiments ont été recueillies au Canada par la Division des relevés hydrologiques y sont présentés sous forme de tableau. L'*Index* est subdivisé selon l'ordre alphabétique par province ou territoire, et les stations de mesure des sédiments sont classées par ordre alphabétique. À partir de 1978, les données sont exprimées en unités du Système international (SI). L'*Index* est publié tous les deux ans; l'édition la plus récente annule toutes les éditions antérieures, car elle renferme toutes les corrections et mises à jour effectuées depuis la dernière parution.

Une autre série de publications a porté le titre *Sommaire chronologique des données sur les sédiments de rivières canadiennes*. La première édition renfermait les données disponibles jusqu'en 1974. Cette série présentait un résumé donnant les moyennes mensuelles et annuelles historiques du débit des sédiments en suspension, les valeurs annuelles extrêmes de la concentration journalière et du débit journalier des sédiments en suspension et le débit annuel total des sédiments en suspension. À partir de 1978, les données ont été présentées en unités du Système international (SI). Cette série a été abandonnée, car une bonne partie de l'information est maintenant contenue dans la nouvelle publication annuelle intitulée *Données sur les sédiments*.

COLLECTION AND PROCESSING OF BASIC DATA

1. *Equipment and Instrumentation*

The sediment survey program of the Water Resources Branch is conducted in cross sections on rivers selected specifically for the sediment survey or for the hydrometric survey. Certain cross sections are located at traffic bridges, while others are equipped with cableways, or automatic pump samplers.

The following sediment samplers have been used in the sediment survey program:

(a) Depth-integrating suspended sediment wading-type hand sampler, USDH-48, used on small streams or during winter periods.

(b) Depth-integrating suspended sediment sampler, USDH-59, used as a handline suspension for small and medium size streams.

(c) Depth-integrating suspended sediment samplers, USD-49, and USD-74, used on a reel suspension for medium and large streams whose depths are less than five metres.

(d) Point-integrating suspended sediment samplers, USP-61, USP-61-A1, USP-63, and USP-72, used for point-integrating sampling, or depth-integrating sampling if the depth is over five metres, or in a cross section with velocities up to two metres per second.

(e) Automatic pump sampler is an automatic pumping system permitting unattended collecting and bottling of individual water samples pumped from a fixed point in a stream. This sampler is normally installed at isolated locations where otherwise no data would be available during ice break-up or peak periods.

(f) Bed material sampler, USBM-54, used on large or deep streams or on those streams with hard-packed streambeds.

(g) Bed material sampler, USBMH-60, used on some large or deep streams or on those streams with soft-packed streambeds.

(h) Bed material sampler, USBMH-53, used on some small or shallow streams.

(i) Lane bed material sampler, a drag-type sampler used on small streams or those with soft streambeds.

2. *Hydrometric Surveys*

The hydrometric survey includes the standard procedures for observations of water levels, streamflow measurements, water surface slope determinations if required, and observations of water temperature. The streamflow measurements are made in conjunction with the sediment load measurements and conform to the accepted standards of the regular hydrometric survey.

3. *Sediment Sampling Program*

The following is a summary of the elements associated with the Sediment Sampling Program:

(a) Periodic measurement of suspended sediment load by the

COLLECTE ET TRAITEMENT DES DONNÉES DE BASE

1. *Matériel*

L'étude des sédiments réalisée par la Direction des ressources en eau porte sur des sections transversales de cours d'eau choisis spécialement à cette fin ou pour les relevés hydrométriques. Certaines sections sont situées sous un pont, d'autres sont accessibles par téléphérique, ou sont étudiées à l'aide d'un échantillonneur sous pression.

On a utilisé les échantillonneurs suivants:

(a) L'échantillonneur intégrateur selon la profondeur, type simple, USDH-48, employé dans les cours d'eau peu profonds ou en hiver;

(b) L'échantillonneur intégrateur selon la profondeur USDH-59, utilisé comme une ligne dans les cours d'eau petits et moyens;

(c) Les échantillonneurs intégrateurs selon la profondeur USD-49 et USD-74 fixés au bout d'une corde s'enroulant autour d'un moulinet et employés dans les cours d'eau gros ou moyens dont la profondeur est inférieure à cinq mètres;

(d) Les échantillonneurs intégrateurs USP-61, USP-61-A1, USP-63 et USP-72, employés ponctuellement ou sur toute la verticale, et utilisés lorsque la profondeur est supérieure à cinq mètres ou dans les sections transversales qui connaissent un débit qui atteint 2 m/s.

(e) Un échantillonneur automatique permettant le prélèvement en bouteilles, sans surveillance, d'échantillons uniques d'eau obtenus à l'aide d'une pompe en un point précis d'un cours d'eau; il est ordinairement installé dans un endroit isolé où aucune donnée ne pourrait être obtenue autrement au cours de la débâcle ou des périodes de débit de pointe;

(f) L'échantillonneur USBM-54 employé pour le prélèvement d'échantillons des matériaux du lit dans les cours d'eau importants ou profonds ou dans les cours d'eau dont le fond est dur;

(g) L'échantillonneur USBMH-60 employé pour le prélèvement d'échantillons des matériaux du lit dans certains cours d'eau importants ou profonds, ou dans les cours d'eau dont le fond est meuble;

(h) L'échantillonneur USBMH-53 employé pour le prélèvement d'échantillons des matériaux du lit dans certains cours d'eau petits ou peu profonds;

(i) La drague employée pour le prélèvement d'échantillons des matériaux du lit dans de petits cours d'eau ou dans des cours d'eau dont le fond est meuble.

2. *Relevés hydrométriques*

Le relevé hydrométrique comprend, entre autres, l'observation de la hauteur des eaux, la mesure du débit de l'eau, la détermination de la pente de la ligne d'eau, si nécessaire, ainsi que l'observation de la température de l'eau. Les mesures du débit de l'eau et du débit des sédiments se font conjointement, suivant les méthodes acceptées.

3. *Échantillonnage des sédiments des cours d'eau*

L'échantillonnage comporte, en gros, les éléments suivants:

(a) La mesure périodique du débit des sédiments en suspension par la méthode d'intégration sur toute la profondeur

depth-integrating method for determining the average suspended sediment concentration in the cross section.

(b) Single suspended sediment samples at a selected vertical for determining the sediment concentration for the days when suspended sediment load measurements are not taken.

(c) Limited measurement of suspended sediment load by the point-integrating method for checking depth-integrated measurements and for determining particle-size distribution in the cross section.

(d) Sampling of bed material for determining particle-size distribution.

(e) Periodic measurement of bed load.

The following is a brief explanation of the elements listed above:

(a) *Suspended Sediment Load by Depth-Integrating Method*: Measurements are made by the depth-integrating method to determine the suspended sediment load in the entire cross section of a stream, the average suspended sediment concentration in the cross section, and the size distribution of the sediment particles. It is known that the concentration of suspended sediment tends to increase from the water surface to the streambed and could vary from streambank to streambank.

When making suspended sediment equal-discharge-increment (EDI) measurements, the stream cross section is divided into at least five equal-flow panels and a representative suspended sediment sample is collected from each portion. For each panel of the cross section, the suspended sediment load (r) may then be computed by multiplying the flow (q) by the suspended sediment concentration (c):

$$r = q\ c$$

The suspended sediment load (R) for the cross section may be computed by adding the sediment loads for the five equal-flow panels:

$$R = r\ n = q_1c_1 + q_2c_2 + \ldots + q_nc_n$$

The depth-integrating method of sampling is used to measure the suspended sediment concentration. This method is based on the premise that the sampler fills at a rate proportional to the velocity of the approaching flow, and that by traversing the depth of a stream at a uniform speed, the sampler will receive a portion of water sediment mixture at every point in the vertical.

(b) *Single Suspended Sediment Samples at a Selected Vertical*: Single suspended sediment samples, consisting of two bottles each, are collected routinely using the depth or point-integrating samplers at a permanently fixed vertical in a cross section. During periods of very heavy sediment concentration, two or three single sediment samples may be taken per day, while during periods of low concentration, one single sediment sample may only be taken every few days. During extremely low flow periods, the sampling may be limited to one single sample in several weeks or months.

(c) *Suspended Sediment Load by Point-Integrating Method*: A limited number of suspended sediment load measurements are made by the point-integrating method. These measurements are included in the program (a) to check by comparison the "measured" sediment loads obtained by the depth-integrating method with the suspended sediment loads by the point-integrating method and (b) to obtain samples from which to determine particle-size distribution

pour la détermination de la concentration moyenne dans une section transversale;

(b) Le prélèvement d'échantillons uniques des sédiments en suspension selon une verticale choisie, afin de déterminer la concentration des sédiments les journées où le débit des sédiments en suspension n'est pas mesuré;

(c) Un nombre restreint de mesures du débit des sédiments en suspension avec intégration en un point précis d'un cours d'eau, afin de vérifier les résultats des mesures avec intégration selon la profondeur et afin de déterminer la granulométrie des particules de sédiments dans une section transversale d'un cours d'eau;

(d) L'échantillonnage des matériaux du lit afin d'en déterminer la granulométrie;

(e) La mesure périodique du charriage.

Voici une brève description des éléments susmentionnés.

(a) *Mesure du débit des sédiments en suspension par intégration selon la profondeur*: La méthode permet de déterminer le débit des sédiments en suspension traversant toute une section transversale d'un cours d'eau, la concentration moyenne des sédiments en suspension dans la section transversale et la granulométrie des sédiments en suspension. C'est un fait connu que la concentration des sédiments en suspension augmente généralement avec la profondeur et qu'elle peut varier d'une rive à l'autre d'un cours d'eau.

Avec la méthode d'incréments de débits égaux (IDE), la mesure du débit des sédiments en suspension se fait en divisant une section transversale d'un cours d'eau en au moins cinq tranches où le débit est égal et en prélevant un échantillon représentatif dans chacune d'elles. Le débit des sédiments en suspension (r) pour chaque tranche se calcule en multipliant le débit (q) par la concentration des sédiments en suspension (c):

$$r = q\ c$$

Le débit des sédiments en suspension (R) pour la section transversale est la somme des débits des sédiments des cinq tranches:

$$R = r\ n = q_1c_1 + q_2c_2 + \ldots + q_nc_n$$

La méthode par intégration sur toute la profondeur est employée pour mesurer la concentration des sédiments en suspension. Elle suppose que l'échantillonneur se remplit à un rythme proportionnel au débit de l'eau et qu'en étant déplacé à une vitesse uniforme sur toute la verticale, il reçoit une partie du mélange eau-sédiments à tous les points de celle-ci.

(b) *Prélèvement d'échantillons uniques de sédiments en suspension sur une verticale choisie*: De tels échantillons, constitués chacun de deux bouteilles, sont prélevés régulièrement à l'aide d'appareils intégrateurs, selon la profondeur ou ponctuels, sur une verticale permanente d'une section transversale. Lorsque la concentration des sédiments est très forte, deux ou trois échantillonnages peuvent être effectués chaque jour, alors qu'un seul échantillon peut être prélevé à quelques jours d'intervalle lorsqu'elle est faible. Au cours des périodes où le débit est extrêmement faible, l'échantillonnage peut être limité à un échantillon toutes les quelques semaine ou tous les quelques mois.

(c) *Mesure du débit des sédiments en suspension par la méthode ponctuelle*: Un nombre limité de mesures du débit des sédiments en suspension sont faites avec cette méthode. On y a recours a) pour vérifier les valeurs du débit mesurées au moyen de la méthode précédente et b) pour obtenir des échantillons en vue de déterminer la granulométrie des sédiments en divers points de la

at different points in the cross section. The point-integrating sediment loads are computed by graphical methods.

The relationship between the suspended sediment concentration of the single vertical samples and the average concentration in the cross section determined from the suspended sediment load measurements is established for some stations. Using this relationship, the sediment concentrations of the single vertical samples are adjusted to reflect the average suspended sediment concentration in the cross section. These average sediment concentrations in the cross sections are plotted, and a smooth curve is drawn through the points to obtain a concentration graph. This graph represents the average suspended sediment concentration for the period of record. The daily mean concentrations are determined by automated procedures using a digitizer interfaced with a Digital minicomputer.

The daily suspended sediment loads are computed on the basis of stream discharges and the collected suspended sediment concentrations. The daily suspended sediment loads are expressed in tonnes per day and are obtained by multiplying the daily mean sediment concentration (mg/L), by the daily mean discharge (m^3/s), and the conversion factor, 0.0864.

(d) *Bed Material Sampling*: In a cross section, bed material samples are usually taken in the same sampling verticals as the suspended sediment samples. Often, additional bed material samples are collected at the water edge, the extreme water level or at other points in the cross section. The total number of bed material samples taken in a cross section usually varies between five and nine.

(e) *Bed Load Measurement*: There are several methods available for measurement of bed load (volumetric method, measurement by samplers, method of tracers, method of constricted cross section, study of sound waves, etc.). The measurement methods should be selected in accordance with river regime.

4. *Total Sediment Load*

Sediment transport may be divided into two categories: sediment maintained in suspension in the stream (suspended load), and sediment being carried along the streambed (bed load). To measure the total sediment load, each of these must be measured separately and then totalled. The total sediment load was not computed for this publication.

5. *Sediment Survey Laboratories*

The Water Resources Branch maintain sediment survey laboratories in New Westminster, British Columbia; Regina, Saskatchewan; Guelph, Ontario; and Moncton, New Brunswick. The laboratories are equipped to perform the following analyses:

(a) determination of sediment concentration by (1) filtration method, (2) evaporation method and (3) determination of total dissolved solids by evaporation method.
(b) particle-size distribution analysis by (1) bottom withdrawal tube method, (2) sieving and (3) hydrometer method.

Determination of the sediment concentration by the evaporation method is carried out by evaporating the water from the settled sediment sample, with the results being corrected for dissolved solids. The quantity of dissolved solids is determined by evaporating a portion of the decanted water of a sample. In the filtration method, the suspended sediment concentration of water samples is determined by utilizing Gooch crucibles with a Reeve Angel 934AH filter and a Millipore AP20 prefilter and a vacuum system.

section transversale. Cette méthode fait appel à des graphiques pour le calcul du débit des sédiments.

Le rapport entre la concentration des sédiments en suspension dans les échantillons prélevés sur une seule verticale et la concentration moyenne dans la section transversale, telle que déterminée à partir des mesures du débit des sédiments en suspension, est établi pour quelques stations. Il permet de corriger les concentrations mesurées à une seule verticale de manière à donner la concentration moyenne dans la section transversale. Les concentrations moyennes ainsi déterminées sont reportées sur un graphique, et une courbe lisse passant par les points marqués est tracée. Le graphique obtenu représente la concentration moyenne des sédiments en suspension pour la période de relevé. Les concentrations moyennes quotidiennes sont déterminées automatiquement à l'aide d'un convertisseur analogique-numérique relié à un mini-ordinateur numérique.

Les valeurs journalières du débit des sédiments en suspension sont calculées à partir du débit du cours d'eau et des concentrations des sédiments en suspension recueillis. Elles sont exprimées en tonnes par jour. On les détermine en multipliant la concentration moyenne journalière des sédiments (mg/L) par le débit moyen journalier (m^3/s) et par un facteur de conversion approprié, 0.0864.

(d) *Échantillonnage des matériaux du lit*: Dans une section transversale, les échantillons des matériaux du lit sont ordinairement prélevés aux mêmes verticales que ceux des sédiments en suspension. Souvent, des échantillons supplémentaires sont pris près des rives, là où le niveau d'eau est extrême et à d'autres points de la section transversale. Leur nombre total pour une section donnée varie ordinairement entre cinq et neuf.

(e) *Mesure du charriage*: La mesure peut se faire par plusieurs méthodes (méthode volumétrique, mesure à l'aide d'échantillonneurs, méthode des traceurs, méthode de la section transversale rétrécie, étude des ondes sonores, etc.). Le choix se fondera sur la nature du régime du cours d'eau.

4. *Débit solide total*

Il y a deux catégories de sédiments: les sédiments maintenus en suspension au sein de l'eau (sédiments en suspension), et les sédiments charriés sur le lit d'un cours d'eau (charriage de fond). Les deux types de sédiments doivent être mesurés séparément et leurs valeurs additionnées si on veut mesurer le débit total des sédiments. Toutefois, on ne l'a pas calculé aux fins de la présente publication.

5. *Laboratoires d'analyse*

La Direction des ressources en eau possède des laboratoires d'analyse des sédiments à New Westminster (Colombie-Britannique), Regina (Saskatchewan), Guelph (Ontario) et Moncton (Nouveau-Brunswick). Les laboratoires disposent des appareils nécessaires pour effectuer les analyses suivantes:

(a) la détermination de la concentration des sédiments par (1) filtration, (2) évaporation, et (3) détermination des matières dissoutes totales par évaporation.
(b) l'analyse granulométrique (1) par extraction des sédiments déposés dans un tube, (2) par l'emploi de tamis et (3) par l'utilisation d'un hydromètre.

La méthode par évaporation consiste à faire évaporer l'eau d'un échantillon de sédiments décanté et à corriger les résultats pour tenir compte des matières dissoutes. La quantité de celles-ci est déterminée en faisant évaporer une partie de l'eau de l'échantillon décanté. Dans la méthode par filtration, on utilise sous vide des creusets de Gooch munis d'un filtre Reeve Angel 934AH et d'un préfiltre Millipore AP20.

Particle-size analysis was carried out for some suspended sediment samples having gross weights in the range of 0.15 to 5 g using the Bottom Withdrawal Tube method. The particle-size distribution of the Bottom Withdrawal Tube method ranges from 0.002 to 1.000 mm. The Sieve analysis method may be used for samples with a large amount of material coarser than 0.062 mm.

The particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)
Clay	0.000 24 - 0.004
Silt	0.004 - 0.062
Sand	0.062 - 2.0
Gravel	2.0 - 64.0

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analyzed in distilled water. Chemical dispersion is not used for native-water analysis.

6. *Accuracy and Reliability of Field Data and Computed Results*

The overall accuracy and degree of reliability of the sediment data is dependent upon many factors. Some of the more important of these are:

(a) accuracy and reliability of streamflow records;
(b) regime of the river;
(c) type of sampling equipment used to collect the suspended sediment samples;
(d) frequency of suspended sediment discharge measurements;
(e) frequency of individual sampling;
(f) quality of the relationship between the average suspended sediment concentration in the cross section and the concentration of the individual samples;
(g) frequency and method of bed material sampling;
(h) frequency and method of bed load measurements;
(i) accuracy and reliability of the laboratory analysis;
(j) selected methods of computation of the suspended sediment discharge;
(k) interpretation and extrapolation of sediment records.

An assessment of the quality of the records can be made by an examination of the occurrence of the symbol (S) on the daily mean concentrations.

In general, data collected during open-water periods are more reliable than those collected during periods of ice conditions or those records obtained by estimation. Further, water level data collected utilizing a water-stage recorder are more reliable and accurate than those using a manual gauge only, especially for small or flashy streams.

Une analyse granulométrique a été effectuée pour certains échantillons de sédiments en suspension ayant un poids brut dans l'intervalle de 0.15 à 5 g par la méthode de la burette (extraction des sédiments déposés, à divers intervalles). La distribution de la taille des particules déterminée par cette méthode varie de 0.002 à 1.000 mm. La méthode de tamisage peut être employée pour les échantillons ayant une forte quantité de particules de taille supérieure à 0.062 mm.

La classification granulométrique qui est utilisée dans la présente publication est conforme aux recommandations faites par l'*American Geophysical Union Subcommittee on Sediment Terminology*. La classification est la suivante:

Classification	Taille (mm)
Argile	0.000 24 - 0.004
Limon	0.004 - 0.062
Sable	0.062 - 2.0
Gravier	2.0 - 64.0

La répartition granulométrique qui est fournie dans cette publication, n'est pas obligatoirement représentative de toutes les particules qui sont transportées par un cours d'eau donné. La plupart des matières organiques sont extraites de l'échantillon qui est ensuite soumis à une dispersion mécanique et chimique avant d'être analysé dans de l'eau distillée. La dispersion chimique ne sert pas à l'analyse de l'eau naturelle.

6. *Exactitude des données et des résultats*

L'exactitude des données sur les sédiments dépend de nombreux facteurs. On peut citer, parmi les plus importants:

(a) l'exactitude des données sur les débits;
(b) le régime d'un cours d'eau;
(c) le type d'appareil d'échantillonnage utilisé pour prélever les échantillons de sédiments en suspension;
(d) la fréquence des mesures du débit des sédiments en suspension;
(e) la fréquence des échantillonnages isolés;
(f) la qualité du rapport entre la concentration moyenne des sédiments en suspension dans une section transversale et la concentration des échantillons isolés;
(g) la fréquence des échantillonnages des matériaux de fond et la méthode utilisée;
(h) la fréquence des mesures du charriage de fond et la méthode utilisée;
(i) l'exactitude des analyses de laboratoire;
(j) les méthodes de calcul du débit des sédiments en suspension;
(k) l'interprétation et l'extrapolation des données sur les sédiments.

La qualité des données peut être évaluée d'après la fréquence d'utilisation du symbole (S), avec les données sur la concentration journalière moyenne.

En général, les données recueillies au cours des périodes d'eau libre sont plus sûres que celles qui sont obtenues au cours des périodes de glaces ou par estimation. De plus, les données sur le niveau des eaux qui sont mesurées à l'aide d'un limnigraphe sont plus certaines et plus exactes que celles qui sont mesurées à l'aide d'une jauge manuelle seulement, surtout dans le cas des petits cours d'eau ou des cours d'eau à crues très rapides.

METHOD OF TABULATION OF SEDIMENT DATA

For stations where the suspended sediment load was obtained, the following data are given where available:

1. The table of *Suspended Sediment Load* includes the daily mean discharge in cubic metres per second, the daily mean concentration in milligrams per litre, and the daily suspended sediment load in tonnes per day. The total monthly discharge and total monthly sediment load are also given for each month of record.

For stations where the sediment load in tonnes per day are produced for complete or partial years, the *Total Suspended Load* for the period is given in the descriptive information.

For stations where only suspended sediment concentrations are obtained, the table of *Suspended Sediment Load* will not be given.

Additional descriptive information about the sediment station is also given and will indicate the following, where applicable.

Location – the latitude and longitude co-ordinates of the location of the gauge are given. For stations where the gauge is located an appreciable distance from the discharge measurement section, these co-ordinates give the location of the discharge measurement section.

Drainage area – refers to that area enclosed by a topographic divide such that direct surface runoff from precipitation would drain by gravity into the stream upstream from the location of the station.

Type of Flow – where the flow is known to be natural, this is indicated. The flow of water in many river systems is affected by upstream regulation. In some cases, the extent of this regulation is not known and therefore is not indicated. However, where the regulation is known to be "appreciable", this is indicated as well as the year that the regulation began, if known.

Type of Gauge – refers to the installation or method used to obtain water level or discharge data:

(a) Manual – a non-recording type of gauge from which observations of stage normally are obtained once daily.

(b) Recording – a water-stage recorder from which continuous water levels are obtained on an analog chart. For most International Gauging Stations located in the United States, water level records are obtained utilizing a digital recorder.

International Gauging Station – on waters adjacent to the international boundary, certain gauging stations have been

PRÉSENTATION DES TABLEAUX DE DONNÉES SUR LES SÉDIMENTS

Pour les stations de mesure du débit des sédiments en suspension, les données suivantes sont présentées, pour autant qu'elles sont disponibles:

1. Le tableau concernant le *débit des sédiments en suspension* (The table of Suspended Sediment Load) donne le débit journalier moyen de l'eau, en mètres cubes par seconde, la concentration journalière moyenne, en milligrammes par litre, et le débit journalier des sédiments en suspension, en tonnes par jour. Chaque mois les données indiquent également les débits mensuels totaux de l'eau et des sédiments.

Dans le cas des stations où le débit des sédiments, en tonnes par jour, est fourni pour une année complète ou une partie de l'année, le total pour la période est indiqué.

Dans le cas des stations où seule la concentration des sédiments en suspension est obtenue, ce tableau est absent.

Des renseignements descriptifs additionnels au sujet de la station sont également présentées. On peut y apporter les précisions suivantes:

Emplacement (Location) – La latitude et la longitude de la station de jaugeage sont indiquées. Dans les cas où l'équipement de mesure est situé à une bonne distance de la section où le jaugeage est effectué, on indique les coordonnées de cette section.

Superficie du bassin versant (Drainage area) – Désigne la zone délimitée par une ligne de faîte de sorte que l'écoulement de surface direct provenant des précipitations est entraîné par gravité vers le cours d'eau, en amont de la station.

Type de débit (Type of Flow) – Un débit reconnu comme naturel est indiqué. Le débit de nombreux réseaux hydrographiques est modifié par une régularisation effectuée en amont. Dans certains cas, l'importance de cette régularisation n'est pas connue, et elle n'est donc pas indiquée. Cependant, quand on sait que la régularisation est d'une certaine importance, on l'indique, ainsi que l'année où elle a débuté (si elle est connue).

Type de jauge (Type of Gauge) – Il s'agit des jauges ou des méthodes de jaugeage utilisées pour obtenir les données sur le niveau ou le débit d'un cours d'eau.

(a) *Manuel* (Manual) – Indique qu'un appareil non enregistreur est employé pour obtenir normalement une fois par jour les données sur le niveau et le débit du cours d'eau.

(b) *Enregistreuse* (Recording) – Indique qu'un limnigraphe permet de mesurer de façon continue le niveau des eaux qui est tracé sur un graphique. La plupart des stations internationales de jaugeage des États-Unis obtiennent les données sur le niveau des eaux à l'aide d'un enregistreur numérique.

Station internationale de jaugeage (International Gauging Station) – Dans les eaux contiguës aux frontières, on a

designated as "International" and records are approved jointly. Differences between figures published herein and corresponding figures in United States Water Supply Papers are due to variations in automated data processing techniques.

Contributed Data – if data were supplied in their entirety or partially by an outside agency, the name of this co-operating agency is given.

Remarks – contains a statement pertaining to the sediment sample collection.

2. The table of *Instantaneous Suspended Sediment Concentration* for depth-integrating samples includes the following: Date and Time of the sample collection; Water Temperature; Instantaneous Discharge at time of sampling, (if not available the daily mean discharge is given and indicated by a symbol); Single Sampling Vertical location; Dissolved Solids; Percent Sand, Silt and Clay; Type of Sampler used. The particle-size distribution in percent in millimetres and the percent Sand, Silt and Clay, is given where available.

The Single Sampling Vertical Location is defined by many symbols, which are as follows, where applicable:

DIGITS - 5, 14, 130, etc., is the distance in metres from the initial point
WERB - Water's Edge RIGHT Bank
WELB - Water's Edge LEFT Bank
1QRB - One-quarter the distance FROM the RIGHT Bank
3QRB - Three-quarters the distance FROM the RIGHT Bank
1QLB - One-quarter the distance FROM the LEFT Bank
3QLB - Three-quarters the distance FROM the LEFT Bank
MID - MID STREAM
MULT - Composite sediment measurement

For the suspended sediment measurements, the Date; Time; Water Temperature at time of sampling; Discharge computed for each sampling panel; Concentration; Sampling Vertical; Dissolved Solids; Percent Sand, Silt and Clay; Type of Sampler used; and the Particle-size distribution of the Sand, Silt and Clay, in percent is given where available.

3. The table of *Split Vertical Suspended Sediment* for depth-integrating samples includes the following: Date and Time of the sample collection; Water Temperature; Instantaneous Discharge at time of sampling, (if not available the daily mean discharge is given and indicated by a symbol); Sampling Vertical; Depth of Sample (giving the depth sampled from and the depth sampled to); Concentration of Sample, in milligrams per litre, Dissolved solids, in milligrams per litre; and the Particle-size distribution in percent in millimetres and the percent Sand, Silt and Clay are also given.

désigné certaines stations comme «internationales», et les données obtenues sont approuvées par les pays concernés. Les différences entre les chiffres publiés dans la présente publications et dans les *United States Water Supply Papers* sont dues à des variantes dans les techniques de traitement automatique des données.

Données fournies (Contributed Data) – Lorsqu'un organisme extérieur a fourni toutes les données ou une partie des données, son nom est indiqué.

Remarques (Remarks) – Renseignements au sujet du prélèvement des échantillons de sédiments.

2. Le tableau des *concentrations instantanées de sédiments en suspension* (The table of Instantaneous Suspended Sediment Concentration) pour les échantillons obtenus par intégration selon la profondeur comprend: la date et l'heure de prélèvement; la température de l'eau; son débit instantané au moment de l'échantillonnage (s'il n'est pas connu, le débit journalier moyen, avec symbole); l'emplacement de la verticale d'échantillonnage; la concentration des matières dissoutes; les pourcentages de sable, de limon et d'argile; le type d'échantillonneur employé; et la granulométrie du sable, du limon et de l'argile, en pourcentage en millimètres et le pourcentage des particules est donné lorsqu'il est disponible.

Le site vertical d'échantillonnage unique est défini par plusieurs symboles dont les suivants dans certains cas :

CHIFFRE - 5, 14, 130, etc., désigne la distance en mètres à partir du point initial
WERB - Bord de l'eau, rive DROITE
WELB - Bord de l'eau, rive GAUCHE
1QRB - Un quart de la distance À PARTIR de la rive DROITE
3QRB - Trois quarts de la distance À PARTIR de la rive DROITE
1QLB - Un quart de la distance À PARTIR de la rive GAUCHE
3QLB - Trois quarts de la distance À PARTIR de la rive GAUCHE
MID - MI-DÉBIT
MULT - Mesure des sédiments mixtes

Pour les mesures des sédiments en suspension, la date, l'heure, la température de l'eau au moment de l'échantillonnage, le débit calculé pour chaque tranche de la section d'échantillonnage, la concentration et la verticale d'échantillonnage, la concentration des matières dissoutes; les pourcentages de sable, de limon et d'argile; le type d'échantillonneur employé; et la granulométrie du sable, du limon et de l'argile, en pourcentage des particules est donnée lorsqu'elle est disponible.

3. Le tableau des *sédiments en suspension fractionnés pris à la verticale* (The Table of Split Vertical Suspended Sediment) pour les échantillons obtenus par intégration selon la profondeur comprend les éléments suivants : la date et l'heure de l'échantillonnage; la température de l'eau; le débit instantané au moment de l'échantillonnage (s'il n'est pas disponible, on donne le débit moyen quotidien et on l'indique par un symbole), la verticale d'échantillonnage; la profondeur (donner la profondeur à laquelle l'échantillon a été pris); et la profondeur à laquelle l'échantillon a été attributé la concentration des échantillons, en milligrammes par litre; la concentration des matières dissoutes, en milligrammes par litre; la distribution des sédiments de la taille de particules en pourcentage en millimètres; le pourcentage de sable, de limon et d'argile.

4. The table of *Point Integrating Particle-size of Suspended Sediment* includes the following: Date and Time of the sample collection; Water Temperature; Panel Discharge for each sampling vertical; Sampling Vertical; Depth of Sample; Concentration of Sample, in milligrams per litre; Dissolved Solids in milligrams per litre, and the Particle-size distribution in percent in millimetres and the percent Sand, Silt and Clay are also given.

5. The table of *Bed Load Particle-size* includes the following: Date and Time of the sample collection; Panel Discharge; Sampling Vertical and the Type of Sampler used in the collection of the sample and the Particle-size distribution, in percent in millimetres, for each sample of bed load collected.

6. The table of *Bed Material Particle-size* includes the following: Date and Time of the sample collection; Panel Discharge; Sampling Vertical and the Type of Sampler used in the collection of the sample and the Particle-size distribution, in percent in millimetres, for each sample of bed material collected.

7. The table of *Historical Sediment Data Summary* gives the following, for the period of record, where applicable.

   (a) Record Summary
   (b) Type of Sampling
   (c) Sampled Concentration, maximum and minimum
   (d) Suspended Sediment Load, maximum daily and the total, for the period, in tonnes
   (e) Summary, including mean load, the historical mean load and the standard error of the mean in percent.

(a) The *Record Summary* gives the months of record that data are available. If the complete month is on file the symbol (C) is shown, while partial months of data are indicated by the symbol (P). Months with no data on file are indicated by (-).

(b) The *Type of Sampling* indicates the type of sampling method used to collect the sediment samples during the period of operation. If the samples were collected by manual methods this is indicated by "MANUAL." If the samples were collected by a pump sampler or some other automatic method this is indicated by "AUTO." If both manual and automatic sampling methods were used this is indicated by "DUAL."

(c) The *Sampled Concentration* gives the maximum and minimum concentration, in milligrams per litre, and the date of collection for each year of record. The extreme recorded for the period of record is indicated by an asterisk (*). If more than one maximum or minimum, of the same value, occurred during the year only the date of the first occurrence is identified by the asterisk.

(d) The *Suspended Sediment Load* gives the maximum daily load, in tonnes, and the date of occurrence. The extreme recorded is indicated by an asterisk (*). The Total for the Period gives

4. Le tableau de la *granulométrie des échantillons ponctuels et intégrés des sédiments en suspension* (The table of Point Integrating Particle-size of Suspended Sediment) comprend: la date et l'heure de prélèvement de l'échantillon, la température de l'eau, le débit de la tranche de la section pour chaque verticale d'échantillonnage, la verticale d'échantillonnage, la profondeur de l'échantillon, la concentration des échantillons, en milligrammes par litre, la concentration des matières dissoutes, en milligrammes par litre, et granulométrie en millimètres et en pourcentage du sable, du limon et de l'argile.

5. Le tableau de la *granulométrie des sédiments charriés* (The table of Bed Load Particle-size) comprend: la date et l'heure de prélèvement de l'échantillon, le débit de la tranche de la section, la verticale d'échantillonnage et le type d'échantillonneur employé et le pourcentage en millimètres des particules pour chaque échantillon recueilli du charriage.

6. Le tableau de la *granulométrie des matériaux du lit* (The table of Bed Material Particle-size) comprend: la date et l'heure de prélèvement de l'échantillon, le débit de la tranche de la section, la verticale d'échantillonnage et le type d'échantillonneur employé et le pourcentage en millimètres des particules pour chaque échantillon recueilli.

7. Le tableau du *sommaire chronologique des données sur les sédiments* (The table of Historical Sediment Data Summary) donne, pour la période pour laquelle les données sont disponibles, les renseignements suivants lorsque de telles données existent:

   (a) Le sommaire du relevé
   (b) Le type d'échantillonnage
   (c) Les concentrations mesurées, maximum et minimum
   (d) Le débit des sédiments en suspension, maximum quotidien et le total pour la période en tonnes
   (e) Résumé, comprend le débit moyen, le débit moyen chronologique et l'erreur type de la moyenne en pourcentage.

(a) Le *sommaire du relevé* donne les mois de relevé pour lesquels les données sont disponibles. Le symbole (C) indique que les données sont disponibles pour tout le mois. Le symbole (P) indique que ces données ne sont disponibles que pour une partie du mois. Enfin, on indique par (-) les mois qui n'ont pas de données.

(b) Le *type d'échantillonnage* indique le type de méthode d'échantillonnage que l'on utilise dans le prélèvement des échantillons de sédiments pendant la période d'exploitation. Si le prélèvement des échantillons se fait par des méthodes manuelles, on indique «MANUEL». Si le prélèvement des échantillons se fait au moyen d'échantillonneur à pompe ou par quelque autre méthode automatique, on indique «AUTO». Si on utilise à la fois des méthodes d'échantillonnage manuelles et automatiques, on indique «DOUBLE».

(c) Pour les *concentrations mesurées* (Sampled Concentration), on donne la concentration maximale et la concentration minimale, en milligrammes par litre, et leur date d'obtention pour chaque année de relevé. La valeur extrême enregistrée est indiquée par un astérisque (*). Si la valeur du maximum ou du minimum a été mesurée plus d'une fois pendant l'année, on signale, par l'astérisque, seulement la date de la première mesure.

(d) Sous le *débit des sédiments en suspension* (Suspended Sediment Load), on donne le débit journalier maximal, en tonnes, et sa date de mesure. Le débit extrême enregistré est indiqué

the total load for the period or year, in tonnes. The extreme recorded is also indicated by an asterisk (*). If more than one maximum or minimum, of the same value, occurred during the year only the date of the first occurrence is identified by the asterisk. A load which has been revised since the previous publication is marked with the symbol.(R) for Revision.

(e) The *Summary* gives the *Mean Load* and the *Historical Mean Load* in tonnes.

The *Standard Error of the Mean* % is calculated using the following equations:

$$SEM = \frac{S}{\bar{x}\sqrt{n}} \times 100\%$$

and

$$S = \sqrt{\frac{\Sigma (x - \bar{x})^2}{n - 1}}$$

where SEM is the Standard Error of the Mean.

- S is the Standard Deviation of the annual mean loads.
- x is the annual Mean Load variable.
- $\bar{x}$ is the Historical Mean Load or the arithmetic mean of the annual Mean Loads.
- n is the number of years for which there is an annual Mean Load.

For stations with only instantaneous samples, this table will not include the *Suspended Sediment Load* or the statistical information in the *Summary*.

DEFINITION OF TERMS

The following definitions are given to clarify the terms used in this publication:

Automatic pump sample is an individual water-sediment mixture pumped from a fixed point in a stream.

Bed load is that material moving in almost continuous contact with the streambed, being rolled or pushed along the bottom by the force of the water.

Bed material is the sediment mixture of which the streambed is composed.

Daily load is the suspended sediment load expressed in tonnes for a particular day. The daily load is obtained by multiplying the daily mean sediment concentration (mg/L) by the daily mean discharge (m^3/s) and the conversion factor, 0.0864.

Daily mean concentration is a time-weighted mean value and is computed from a manually constructed concentration curve. The mean concentration value may be determined arithmetically or graphically. The arithmetic mean is obtained either by (1) selecting values from the concentration graph that represents uniform intervals of time and taking the arithmetic average or by (2) selecting values from the graph that represent unequal intervals of time and weighing these values by the

par un astérisque (*). Le débit total pour la période ou pour l'année est indiqué. La valeur extrême est également signalée par un astérisque (*). Si la valeur du maximum ou du minimum a été mesurée plus d'une fois pendant l'année, on signale, par l'astérisque, seulement la date de la première mesure. La lettre R indique qu'une valeur du débit a été révisée depuis la dernière publication.

(e) Le *résumé* donne le *débit moyen* et le *débit moyen chronologique*, en tonnes.

L'*erreur-type de la moyenne* % (Standard Error of the Mean), est calculée à l'aide des équations suivantes:

$$SEM = \frac{S}{\bar{x}\sqrt{n}} \times 100\%$$

et

$$S = \sqrt{\frac{\Sigma (x - \bar{x})^2}{n - 1}}$$

où SEM est l'erreur type de la moyenne.

- S est l'écart type des débits moyens annuels.
- x est la variable du débit moyen annuel.
- $\bar{x}$ est le débit moyen chronologique ou la moyenne arithmétique des débits moyens annuels.
- n est le nombre d'années où il y a un débit moyen annuel.

Dans le cas des stations ne prélevant que des échantillons instantanés, ce tableau ne donnera pas le *débit des sédiments en suspension* ni les données statistiques du *résumé*.

DÉFINITION DES TERMES

Les définitions suivantes sont présentées afin de faciliter la compréhension des termes utilisés dans la présente publication:

Échantillonnage automatique à l'aide d'une pompe (Automatic pump sample): Prélèvement d'un mélange de sédiments et d'eau au moyen d'une pompe fonctionnant automatiquement, en un point précis d'un cours d'eau.

Charriage (Bed load): Matières roulées ou poussées sur le fond sous l'action de l'eau, mais restant en contact presque permanent avec le fond.

Matériau du lit (Bed material): Mélange de sédiments composant le lit d'un cours d'eau.

Débit journalier des sédiments en suspension (Daily load): Débit des sédiments en suspension exprimé en tonnes par jour, pour une journée donnée. On l'obtient en multipliant la concentration journalière moyenne des sédiments (mg/L) par le débit journalier moyen de l'eau (m^3/s) et le facteur de conversion 0.0864.

Concentration journalière moyenne (Daily mean concentration): Moyenne pondérée en fonction du temps, calculée à partir d'une courbe de la concentration établie manuellement. La valeur de la concentration moyenne peut être déterminée arithmétiquement ou graphiquement. Pour la déterminer arithmétiquement, on peut, soit choisir sur la courbe des valeurs représentant des intervalles uniformes de temps et faire la moyenne arithmétique, soit choisir sur cette courbe

time intervals represented by the concentrations. For graphical explanation refer to *Office Procedures for Sediment Data Computations* and for the automated graphical explanation refer to *Automated Hydrometric Computation Procedures.*

Depth-integrated sediment sample is a suspended sediment sample collected at a single vertical in a cross section in a sampler moving vertically at a constant transit rate and represents an average sample for that part of the depth ranging from the water surface to about nine centimetres above the streambed.

Instantaneous suspended sediment sample is a sample collected at a fixed vertical in a river cross section.

Measured suspended sediment discharge is the suspended sediment discharge that can be computed from stream discharge and the concentration of sediment determined from depth-integrated sediment samples.

Particle-size analysis is the process of determining the size distribution of particles in a sediment sample.

Point-integrated sediment sample is a sample of the water-sediment mixture taken over a specified period of time at a fixed point and depth in a river cross section.

Sediment is fragmental material which has been deposited, eroded or transported by a flowing stream.

Sediment hydrograph is a graph showing the variation of suspended sediment concentration or sediment discharge with respect to time.

Single sample is a sample taken at a selected permanent vertical in a cross section. Two bottles of water-sediment mixture make up each single sample.

Single sampling vertical is a selected permanent vertical in a cross section in which single suspended sediment samples are collected.

Suspended sediment is sediment that moves in suspension in water either as a colloid or through the influence of the upward component of turbulent currents.

Suspended sediment concentration is the ratio of the weight of dry solids in a water-sediment mixture to the volume of the mixture. The units of this ratio are "milligrams per litre" (mg/L).

Suspended sediment load is the quantity of suspended sediment transported through a cross section per unit of time.

des valeurs qui représentent des intervalles inégaux de temps et pondérer ces valeurs en fonction des intervalles de temps correspondants. En ce qui concerne les méthodes graphiques, consulter *Méthodes de bureau pour les calculs de données sur les sédiments* et, pour la méthode automatisée, *Automated Hydrometric Computation Procedures.*

Échantillon intégré sur toute la profondeur (Depth integrated sediment sample): Échantillon des sédiments en suspension prélevé sur une verticale précise d'une section transversale d'un cours d'eau à l'aide d'un échantillonneur se déplaçant verticalement à une vitesse constante; il représente un échantillon moyen des matières en suspension entre la surface de l'eau et environ 9 cm du fond.

Échantillon instantané de sédiments en suspension (Instantaneous suspended sediment sample): Échantillon prélevé à une verticale précise d'une section transversale d'un cours d'eau.

Débit mesuré des sédiments en suspension (Measured suspended sediment discharge): Débit des sédiments en suspension qui peut être calculé à partir du débit du cours d'eau et de la concentration des sédiments déterminée à partir d'échantillons intégrés sur toute la profondeur.

Analyse granulométrique (Particle-size analysis): Détermination de la répartition de la taille des particules dans un échantillon de sédiments.

Échantillon ponctuel et intégré (Point-integrated sediment sample): Échantillon constitué d'un mélange d'eau et de sédiments, prélevé au cours d'une période de temps donnée en un point précis d'une section transversale d'un cours d'eau et à une profondeur donnée.

Sédiments (Sediment): Matières fragmentaires qui ont été déposées, érodées ou transportées par un cours d'eau.

Hydrogramme des sédiments (Sediment hydrograph): Graphique représentant la variation de la concentration des sédiments en suspension ou du débit des sédiments en fonction du temps.

Échantillon unique (Single sample): Échantillon prélevé sur une verticale permanente particulière dans une section transversale. Deux bouteilles du mélange eau-sédiments constituent un seul échantillon.

Verticale d'échantillonnage unique (Single sampling vertical): Verticale permanente d'une section transversale où des échantillons uniques de sédiments en suspension sont prélevés.

Sédiments en suspension (Suspended sediment): Matériaux qui se déplacent au sein de l'eau, soit sous forme colloïdale, soit sous l'influence des forces ascendantes des courants turbulents.

Concentration des sédiments en suspension (Suspended sediment concentration): Rapport entre le poids des matières solides sèches contenues dans un mélange eau-sédiments et le volume du mélange. Les unités employées sont les «milligrammes par litre» (mg/L).

Débit des sédiments en suspension (Suspended sediment load): Quantité de sédiments en suspension transportés par unité de temps à travers une section transversale d'un cours d'eau.

Total sediment load is the sum of the suspended sediment load and the bed load.

Unmeasured sediment load is the difference between total sediment load and measured suspended sediment load.

DEFINITION OF SYMBOLS

Symbols are located at the bottom of the data sets under the headings Time, Discharge, Concentration, and Dissolved Solids. The symbols with their definitions are listed below.

Time Symbol

E – *Estimated* – indicates estimated data. It indicates that the time of sample collection is estimated by some indirect method or comparison with other stream data.

Discharge Symbol(s)

A – *Manual Gauge* – indicates that one or more manual gauge observations per day were obtained and used as the mean for the day for a gauging station equipped with a recording gauge. This symbol is used during open-water periods only.

B – *Ice Conditions* – indicates the presence of ice at the gauging station. For gauging stations where discharge data are obtained, this symbol indicates that the presence of ice has affected the stage-discharge relationship.

E – *Estimated* – indicates estimated data. It indicates that the values recorded are estimated by some indirect method such as interpolation, extrapolation, comparison with other streams or by comparison with meteorological data.

H – *Daily Mean Discharge* – is the mean discharge for a particular day, usually referred to as the "daily mean discharge".

V – *Daily Mean; Manual Gauge* – is the mean discharge for a particular day and indicates that one or more manual gauge observations per day were obtained and used as the mean for the day.

W – *Daily Mean; Ice Conditions* – is the mean discharge for a particular day and indicates that the presence of ice has affected the stage-discharge relationship.

Y – *Daily Mean; Estimated* – is the mean discharge for a particular day and indicates that the value has been estimated by some indirect method.

Concentration Symbol(s)

C – *Coarse Material Present* – indicates that during the laboratory analysis coarse material (sand) was observed in the sediment sample.

Débit total des sédiments (Total sediment load): Somme du débit des sédiments en suspension et du débit charrié.

Débit non mesuré des sédiments (Unmeasured sediment load): Différence entre le débit total des sédiments et le débit mesuré des sédiments en suspension.

DÉFINITION DES SYMBOLES

Les symboles figurent au bas des séries de données et sont traités sous les rubriques Temps, Débit, Concentration, Matières solides en solution. Ces symboles avec leurs définitions sont donnés dans la liste ci-après.

Symbole du temps :

E – *Estimative* – Indique des données estimatives, c'est-à-dire que l'heure de prélèvement de l'échantillon est évaluée de façon indirecte ou par comparaison avec d'autres données sur les cours d'eau.

Symbole(s) du débit :

A – *Turbidisonde simple* – Indique qu'on a effectué à une station de jaugeage dotée d'une turbidisonde enregistreuse au moins une observation par jour à l'aide d'une turbidisonde simple et qu'on s'en est servi comme moyenne pour la journée en question. Le symbole n'est employé qu'au cours des périodes d'eau libre.

B – *Glaces* – Indique la présence de glaces à la station de jaugeage, qui ont faussé la relation hauteur-débit.

E – *Estimative* – Indique des données estimatives, c'est-à-dire que les valeurs enregistrées sont évaluées de façon indirecte, par exemple par interpolation, extrapolation, ou par comparaison avec d'autres cours d'eau ou avec des données météorologiques.

H – *Débit journalier moyen* – Débit moyen pour une journée donnée, ordinairement appelé «débit journalier moyen».

V – *Débit journalier moyen; turbidisonde simple* – Débit moyen pour une journée donnée; indique qu'on a effectué au moins une observation par jour et qu'on s'en est servi comme moyenne pour la journée en question.

W – *Débit journalier moyen; glaces* – Débit moyen pour une journée donnée; indique que la présence de glaces a faussé la relation hauteur-débit.

Y – *Débit journalier moyen; estimative* – Débit moyen pour une journée donnée; indique que la valeur a été évaluée de façon indirecte.

Symbole(s) de la concentration :

C – *Sable grossier présent* – Indique qu'au cours de l'analyse en laboratoire on a observé du sable grossier dans un échantillon de sédiments.

F – ***Sample Bottle Filled*** – indicates that during the laboratory analysis it was observed that the sample bottle had been filled to capacity.

G – ***Organic Material Present*** – indicates that during the laboratory analysis it was observed that organic material was collected in the sample bottle.

Single Vertical Symbol(s)

K – ***Sampling vertical not at the regular single vertical from LEFT bank*** – indicates that a sample was collected at a location from the left bank, in a cross-section, which is not at the regular single vertical.

L – ***Sediment measurement vertical not at the regular measurement cross-section from LEFT bank*** – indicates that the measurement sampling verticals were established from the left bank, in a cross-section which is not the regular measurement cross-section.

M – ***Sediment measurement vertical*** – indicates that the sampling vertical is one of several, usually five, and represents a panel width. The instantaneous discharge represents the flow for a panel width.

X – ***Sampling vertical not at the regular single vertical*** – indicates that a sample was collected at a location, in a cross-section, which is not at the regular single vertical. The location of the regular single vertical is given at the bottom of the Instantaneous Suspended Sediment data.

Z – ***Sediment measurement vertical not at the regular measurement cross-section*** – indicates that a suspended sediment measurement was collected in a cross-section which is not the regular measurement corss-section.

Note: If no symbol is present the samples have then been collected at the regular Single Vertical.

F – ***Flacon d'échantillonnage rempli*** – Indique qu'au cours de l'analyse en laboratoire on a observé que le flacon d'échantillonnage avait été complètement rempli.

G – ***Substance organique présente*** – Indique qu'au cours de l'analyse en laboratoire on a observé qu'une substance organique a été prélevée dans le flacon d'échantillonnage.

Symbole(s) de la verticale unique :

K – ***Verticale d'échantillonnage à l'extérieur de la verticale unique habituelle à partir de la rive GAUCHE*** – Indique qu'un échantillon a été prélevé à un endroit à partir de la rive gauche, dans une section transversale, mais à l'extérieur de la verticale unique habituelle.

L – ***Verticale de mesure des sédiments, à l'extérieur de la section transversale de mesure habituelle à partir de la rive GAUCHE*** – Indique que les verticales de mesure d'échantillonnage ont été établies à partir de la rive gauche, dans un section transversale à l'extérieur de la section transversale de mesure habituelle.

M – ***Verticale de mesure des sédiments*** – Indique que la verticale d'échantillonnage est l'une de plusieurs verticales, en général cinq, et qu'elle représente la dimension d'une tranche. Le débit instantané représente le débit relatif à la dimension d'une tranche.

X – ***Verticale d'échantillonnage à l'extérieur de la verticale unique habituelle*** – Indique qu'un échantillon a été prélevé à un endroit, dans une section transversale, mais à l'extérieur de la verticale unique habituelle. L'endroit de la verticale unique habituelle est donné à la fin des données sur les sédiments en suspension instantanés.

Z – ***Verticale de mesure des sédiments, à l'extérieur de la section transversale de mesure habituelle*** – Indique qu'une mesure de sédiments en suspension a été prise dans une section transversale à l'extérieur de la section transversale de mesure habituelle.

Note : S'il n'y a pas de symbole, cela indique que les échantillons ont été prélevés à la verticale unique habituelle.

EQUIVALENTS OF MEASURE

The following list of convenient equivalents of measure includes the relationship between imperial units and the International System of Units (SI).

1 inch equals 2.54 cm (centimetres)
1 foot equals 0.3048 m (metre)
1 statute mile equals 1.6093 km (kilometres)

1 cm (centimetre) equals 0.393 70 inch
1 m (metre) equals 3.2808 feet
1 km (kilometre) equals 0.621 37 mile

1 acre equals 43 560 square feet
1 acre equals 0.404 69 ha (hectare)
1 square mile equals 640 acres
1 square mile equals 2.5900 km^2 (square kilometres)
1 square mile equals 259.0 ha (hectares)

1 ha (hectare) equals 10 000 m^2 (square metres)
1 ha (hectare) equals 2.4710 acres
1 km^2 (square kilometre) equals 0.386 10 square mile

1 cubic foot equals 6.2288 imperial gallons
1 imperial gallon equals 4.546 09 L (litres)
1 imperial gallon equals 1.2010 U.S. gallons
1 U.S. gallon equals 0.133 68 cubic foot
1 cubic foot equals 0.028 317 m^3 (cubic metre)
1 m^3 (cubic metre) equals 35.315 cubic feet
1 dam^3 (cubic decametre) equals 1000 m^3 (cubic metres)
1 dam^3 (cubic decametre) equals 1 mm (millimetre) over 1 km^2 (square kilometre)

1 cubic foot per second for one day equals 1.9835 acre-feet
1 cubic foot per second for one day covers one square mile to a depth of 0.037 19 inch
1 acre-foot equals 1.2335 dam^3 (cubic decametres)
1 m^3/s (cubic metre per second) for one day equals 86.4 dam^3 (cubic decametre)
1 m^3/s (cubic metre per second) for one day covers one square kilometre to a depth of 0.0864 m (metre)

1 foot per second equals 0.6818 mile per hour
1 mile per hour equals 1.467 feet per second
1 m/s (metre per second) equals 3.6 km/h (kilometre per hour)
1 km/h (kilometre per hour) equals 0.2778 m/s (metre per second)

1 cubic foot per second equals 0.028 317 m^3/s (cubic metre per second)
1 m^3/s (cubic metre per second) equals 35.315 cubic feet per second

1 pound equals 0.453 59 kg (kilogram)
1 kg (kilogram) equals 2.2046 pounds

1 short ton (2000 pounds) equals 0.907 18 t (tonne)
1 t (tonne) equals 2204.6 pounds

degrees Celsius = 5/9 (degrees Fahrenheit - 32)
degrees Fahrenheit = 9/5 (degrees Celsius) + 32

ÉQUIVALENCES DES UNITÉS DE MESURE

Voici une liste des unités de mesure impériales et leurs équivalences dans le Système international d'unités (SI).

1 pouce vaut 2.54 cm (centimètres)
1 pied vaut 0.3048 m (mètre)
1 mille terrestre vaut 1.6093 km (kilomètre)

1 cm (centimètre) vaut 0.393 70 pouce
1 m (mètre) vaut 3.2808 pieds
1 km (kilomètre) vaut 0.621 37 mille

1 acre vaut 43 560 pieds carrés
1 acre vaut 0.404 69 ha (hectare)
1 mille carré vaut 640 acres
1 mille carré vaut 2.5900 km^2 (kilomètres carrés)
1 mille carré vaut 259.0 ha (hectares)

1 ha (hectare) vaut 10 000 m^2 (mètres carrés)
1 ha (hectare) vaut 2.4710 acres
1 km^2 (kilomètre carré) vaut 0.386 10 mille carré

1 pied cube vaut 6.2288 gallons impérials
1 gallon impérial vaut 4.546 09 L (litres)
1 gallon impérial vaut 1.2010 gallon américain
1 gallon américain vaut 0.133 68 pied cube
1 pied cube vaut 0.028 317 m^3 (mètre cube)
1 m^3 (mètre cube) vaut 35.315 pieds cubes
1 dam^3 (décamètre cube) vaut 1000 m^3 (mètres cubes)
1 dam^3 (décamètre cube) vaut 1 mm (millimètre) qui couvre 1 km^2 (kilomètre carré)

1 pied cube par seconde pendant un jour vaut 1.9835 acre-pied
1 pied cube par seconde pendant un jour couvre un volume d'un mille carré par 0.037 19 pouce
1 acre-pied vaut 1.2335 dam^3 (décamètre cube)
1 m^3/s (mètre cube par seconde) pour un jour vaut 86.4 dam^3 (décamètres cubes)
1 m^3/s (mètre cube par seconde) pour un jour couvre un kilomètre carré à une profondeur de 0.0864 m (mètre)

1 pied par seconde vaut 0.6818 mille par heure
1 mille par heure vaut 1.467 pied par seconde
1 m/s (mètre par seconde) vaut 3.6 km/h (kilomètres par heure)
1 km/h (kilomètre par heure) vaut 0.2778 m/s (mètre par seconde)

1 pied cube par seconde vaut 0.028 317 m^3/s (mètre cube par seconde)
1 m^3/s (mètre cube par seconde) vaut 35.315 pieds cubes par seconde

1 livre vaut 0.453 59 kg (kilogramme)
1 kg (kilogramme) vaut 2.2046 livres

1 tonne courte (2000 livres) vaut 0.907 18 t (tonne)
1 t (tonne) vaut 2204.6 livres

degrés Celsius = 5/9 (degrés Fahrenheit - 32)
degrés Fahrenheit = 9/5 (degrés Celsius) + 32

CO-OPERATION AND ACKNOWLEDGMENTS

Co-operative undertakings with other agencies form an important part of the activities of the Water Survey of Canada. Close co-operation has been maintained with public agencies and private organizations concerned with water resources. Data have been mutually exchanged and suspended sediment collection operations have been facilitated by the assistance received from a number of organizations.

On waters adjacent to the International Boundary, certain sediment stations are maintained by Canada (or the United States) under agreement with the United States (or Canada) and the records are collected and compiled in a manner equally acceptable to both countries. These stations are designated as "International Gauging Stations" in this publication.

For the valuable assistance and co-operation received in obtaining sediment survey records, the Water Survey of Canada is indebted to other federal and provincial organizations which are noted as contributing agencies in the summary for the year. A list of these agencies may be found in the *Sediment Data Reference Index*.

REVISIONS

A number of corrections or revisions have been made to previously published data. Many of these were required because of typographical or computational errors which were exposed when the data were stored on magnetic tape and monthly means were re-calculated by computer. Other errors were discovered or different interpretations of basic data were made during the systematic review of historical streamflow data.

Revisions to daily discharges or sediment data are not published at present. However, those stations where a systematic review has been conducted are identified in the Surface Water Data Reference Index publication. The Historical Streamflow Summary publications contain revisions to monthly and annual mean discharges, and annual extremes of discharge. Revisions, corrections or additions made to discharges and sediment after January 1, 1980, are indicated by an "R" symbol in the data summaries. Detailed information on revisions to historical data is available from the appropriate Regional Chief.

COOPÉRATION ET REMERCIEMENTS

Le travail entrepris en coopération avec d'autres organismes représente une partie importante des activités de la Division des relevés hydrologiques du Canada. On a maintenu une étroite collaboration avec les organismes, publics ou privés, qui s'intéressent aux ressources en eau. On a échangé des données sur les sédiments, et l'assistance fournie par certains organismes a facilité les opérations d'échantillonnage des sédiments en suspension.

Dans les eaux adjacentes à la frontière internationale, les stations dépendent du Canada ou des États-Unis selon l'accord intervenu entre les deux pays, et les relevés sont faits et compilés de façon à satisfaire les deux pays. Ces stations sont nommées «Stations internationales de jaugeage» dans la présente publication.

La Division des relevés hydrologiques du Canada est redevable à plusieurs organismes fédéraux et provinciaux, dont les noms apparaissent dans le sommaire de l'année, de l'aide et de la collaboration qu'ils lui ont apportées pour l'obtention des données sur les sédiments. On trouvera également les noms des organismes qui ont fourni des données dans l'*Index de référence des données sur les sédiments*.

RÉVISIONS

On a corrigé ou révisé des données déjà publiées. Il a été nécessaire d'effectuer plusieurs corrections, car on a relevé des erreurs typographiques ou de calcul lorsqu'on a enregistré les données sur rubans magnétiques et qu'on a recalculé les moyennes mensuelles à l'aide d'un ordinateur. On a aussi relevé d'autres erreurs ou fait des interprétations différentes de certaines données de base au cours de la révision systématique des données historiques sur le débit.

Les corrections apportées aux débits journaliers ou aux données sur les sédiments ne sont pas publiées, du moins pour le moment. Cependant, les stations où on a effectué une révision systématique sont indiquées dans l'*Index de référence des données sur les eaux de surface*. Les publications intitulées *Sommaire chronologique de l'écoulement* contiennent des données révisées sur les débits mensuels et annuels moyens et les extrêmes annuels du débit. Les révisions, corrections ou ajouts apportés aux données sur les débits et sur les sédiments après le 1er janvier 1980 sont indiqués par la lettre R dans les résumés des données. On peut obtenir plus de détails sur les révisions en s'adressant au chef régional concerné.

ANTLER RIVER NEAR MELITA - STATION NO. 05NF002

LOCATION: LAT 49 03 34 N LONG 101 02 56 W
DRAINAGE AREA: 3 210 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1976	--CCCCCCC--	MANUAL	85	APR 11	0	AUG 31 *	687	APR 12 *	8 890 *	39.5	39.5	---
1977	--CCCCCCCCC	MANUAL	39	APR 9	0	MAR 1	0.5	MAY 22	16.3	0.179	19.8	99.1
1978	CCCCCCCCCCC	MANUAL	22	MAY 21	0	JAN 1	4.8	APR 4	39.1	0.641	13.4	97.0
1979	CCCCCCCCCCC	MANUAL	117	APR 23	0	JAN 1	312	APR 24	1 430	12.1	13.1	70.4
1980	CCCCCCCCCCC	MANUAL	81	APR 18	0	JAN 1	2.7	APR 18	7.85	0.127	10.5	72.3
1981	CCCCCCCCCCC	MANUAL	31	FEB 27	0	JAN 1	7.9	FEB 27	25.5	0.140	8.78	73.4
1982	CCCCCCCCCCC	MANUAL	84	APR 17	0	JAN 1	170	APR 17	606	5.18	8.26	66.2
1983	CCCCCCCCCCC	MANUAL	27	APR 26	0	JAN 1	29.2	APR 26	285	2.44	7.54	63.6
1984	CCCCCCCCCCC	MANUAL	21	MAR 25	0	JAN 1	0.2	APR 2	5.32	0.072	6.71	64.2
1985	CCCCCCCCCPC	MANUAL	167	NOV 7 *	0	JAN 1	33.0	MAR 23	294	1.61	6.20	62.7
1986	CCCCCCCCCCC	MANUAL	45	MAY 13	0	SEP 12	25.7	MAY 13	418	1.83	5.80	61.0
1987	CCCCCCCCCP-	MANUAL	82	APR 6	0	JUL 8	90.7	APR 9	897	5.74	5.79	55.7

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MANITOBA

ASSINIBOINE RIVER AT HEADINGLEY - STATION NO. 05MJ001

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 49 52 09 N LONG 097 24 10 W
DRAINAGE AREA: 153 000 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 142 000 TONNES FOR THE PERIOD MAR 01 TO OCT 31

REMARKS: BEG. 1987, NOV, DEC, JAN & FEB SAMPLED ONLY ABOVE SPECIFIED FLOWS

	MAR			APR			MAY			
DAY	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	14.6 B	24	30.3	34.2 B	105	310	112	251	2 430	1
2	14.6 B	24	30.3	43.3 B	109	408	113	251 S	2 450	2
3	14.2 B	24	29.4	61.0 B	145	764	113	251	2 450	3
4	13.9 B	24	28.8	76.3 B	222	1 460	112	267 S	2 580	4
5	15.0 B	24	31.1	84.8 B	290	2 120	106	258	2 360	5
6	15.3 B	24	31.7	97.3 B	330	2 770	97.4	241	2 030	6
7	15.2 B	24	31.5	103 B	339	3 020	94.5	227 S	1 850	7
8	15.4 B	24	31.9	112 B	317	3 070	84.3	206 S	1 500	8
9	15.8 B	24	32.8	112 B	269	2 600	72.9	201 S	1 270	9
10	15.7 B	24	32.5	104 B	221	1 990	65.8	184 S	1 050	10
11	15.8 B	24	32.8	96.0 B	196	1 630	64.0	168	929	11
12	16.0 B	24	33.2	95.0 B	188	1 540	56.7	152 S	745	12
13	15.7 B	24	32.5	95.2 B	183	1 510	59.0	148	742	13
14	15.7 B	24 S	32.5	94.1 B	172	1 400	55.8	133 S	641	14
15	17.4 B	27	40.6	92.8 B	171	1 370	52.4	111	503	15
16	23.1 B	33	65.9	103 B	188	1 670	46.5	108 S	434	16
17	31.2 B	35	94.1	118 B	276	2 810	47.7	107	441	17
18	29.7 B	31	79.5	140 B	471	5 700	48.9	106 S	448	18
19	23.9 B	27	55.7	176 B	577	8 770	52.4	111	503	19
20	20.7 B	24	42.9	140	475	5 750	54.4	123 S	578	20
21	22.9 B	35	69.2	134	432	5 000	56.5	134	654	21
22	31.2 B	60	162	111	401	3 850	55.2	121 S	577	22
23	33.3 B	62	178	92.6	377	3 020	52.3	99	447	23
24	32.6 B	58	163	77.0	353 S	2 350	49.2	85 S	361	24
25	30.8 B	55	146	69.4	285	1 710	46.9	78	316	25
26	29.3 B	51	129	76.9	287 S	1 910	44.5	69	265	26
27	27.6 B	43 S	103	90.6	289	2 260	39.0	51	174	27
28	25.5 B	39	85.9	98.9	260 S	2 220	40.3	50	174	28
29	22.6 B	36	70.3	106	254	2 330	42.2	55	201	29
30	21.1 B	44	80.2	111	251 S	2 410	45.4	60	235	30
31	26.1 B	79	178				47.7	66 S	272	31
TOTAL	661.9		2 185	2 945.4		77 722	2 026.9		29 608	

	JUN			JUL			AUG			
DAY	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	48.8	72	304	40.2	116 S	403	25.7	132	293	1
2	50.6	71 S	310	39.3	114	387	25.1	135 S	293	2
3	50.9	63	277	38.3	113	374	24.5	129	273	3
4	52.0	61 S	274	37.4	116	375	24.1	114	237	4
5	52.6	61	277	38.6	120	400	23.6	101	206	5
6	50.7	60 S	263	38.0	120	394	23.8	100	206	6
7	48.4	70	293	37.0	114	364	23.8	101	208	7
8	47.5	95 S	390	33.1	116	332	23.3	96	193	8
9	48.8	111	468	33.9	132	387	23.0	95	189	9
10	51.0	120 S	529	34.2	146 S	431	22.6	94	184	10
11	53.4	128	591	33.1	160	458	22.7	94	184	11
12	52.4	124	561	33.2	173	496	22.9	96	190	12
13	48.2	117	487	33.4	184 S	531	23.2	101	202	13
14	43.6	114 S	429	33.5	189	547	23.1	96 S	192	14
15	41.5	113	405	33.0	188	536	22.4	76 S	147	15
16	40.7	114 S	401	32.3	186	519	22.1	68	130	16
17	39.2	113	383	32.3	182 S	508	21.7	66	124	17
18	38.3	112 S	371	32.0	180	498	20.2	62	108	18
19	38.8	114	382	32.2	183	509	19.1	60	99.0	19
20	39.4	121 S	412	32.5	184	517	18.4	60 S	95.4	20
21	39.1	125	422	31.9	180	496	17.9	60	92.8	21
22	39.6	121 S	414	30.9	175	467	17.6	60	91.2	22
23	39.5	118	403	30.5	168 S	443	17.6	61	92.8	23
24	38.4	116	385	29.9	156	403	19.0	67	110	24
25	38.0	113 S	371	28.7	142	352	21.0	81	147	25
26	37.9	112	367	27.1	133	311	20.7	81 S	145	26
27	39.5	114 S	389	26.2	122	276	19.8	75	128	27
28	41.5	129	463	25.8	116 S	259	18.5	71	113	28
29	42.2	132 S	481	25.5	115	253	17.1	68 S	100	29
30	41.8	123	444	25.5	115	253	16.0	67	92.6	30
31				25.8	122	272	14.9	66	85.0	31
TOTAL	1 334.3		11 946	1 005.3		12 751	655.4		4 951	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

ASSINIBOINE RIVER AT HEADINGLEY - STATION NO. 05MJ001

SUSPENDED SEDIMENT FOR 1990

DAY	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)	SEP DAILY LOAD (t)	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	DAY DAILY DISCHARGE (m^3/s)	DAY MEAN CONCENTRATION (mg/L)	DAY DAILY LOAD (t)	DAY
1	13.9	64	76.9	23.2	64	128				1
2	13.8	64 S	76.3	18.1	49	76.6				2
3	13.9	64	76.9	13.9	33	39.6				3
4	14.1	64	78.0	11.4	25	24.6				4
5	13.0	64	71.9	12.4	26	27.9				5
6	13.4	65	75.3	12.4	27	28.9				6
7	13.2	63	71.9	10.7	23	21.3				7
8	11.8	57	58.1	9.99	21	18.1				8
9	11.5	51 S	50.7	10.7	25	23.1				9
10	10.7	47	43.5	10.7	26	24.0				10
11	10.2	50	44.1	11.5	29	28.8				11
12	10.3	55	48.9	11.6	27	27.1				12
13	8.99	51 S	39.6	10.0	24	20.7				13
14	8.23	49	34.8	11.2	26	25.1				14
15	8.41	51	37.0	12.4	29	31.1				15
16	8.36	50	36.1	13.4	30	34.7				16
17	7.92	49	33.5	13.7	30	35.5				17
18	8.44	66 S	48.1	12.4	27	28.9				18
19	9.26	87	69.6	13.3	30	34.5				19
20	14.3	106	131	12.8	31	34.3				20
21	17.8	117	180	12.6	32	34.8				21
22	15.1	109	142	12.7	32	35.1				22
23	12.2	93	98.0	12.7	31	34.0				23
24	10.7	81	74.9	12.7	31	34.0				24
25	10.0	73 S	63.1	12.5	29 S	31.3				25
26	9.32	53	42.7	12.4	27	28.9				26
27	14.6	51	64.3	13.3	25	28.7				27
28	20.7	59	106	14.2	23	28.2				28
29	23.7	66	135	14.8	21	26.9				29
30	25.6	70 S	155	15.4	20	26.6				30
31				17.2	19 S	28.2				31
TOTAL	383.43		2 263	406.29		1 050				

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

ASSINIBOINE RIVER AT HEADINGLEY - STATION NO. 05MJ001

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)		SINGLE SAMPLING VERTICAL (m)		TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)		DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAR 14	14:15	0.5	15.7	B	---	X	DH48	24		676														
MAR 27	15:45	0.5	27.2	B	---	X	DH48	42		478														
APR 24	12:05	15.0	76.8		75.0		DH59	359		422														
APR 26	18:30	10.0	81.8		75.0		DH59	301																
APR 28	10:00	4.0	98.3		75.0		DH59	249																
APR 30	17:30	6.0	111		75.0		DH59	251		532														
MAY 02	17:30	7.0	114		75.0		DH59	250		490												4	40	56
MAY 04	19:00	10.0	112		75.0		DH59	274		467	32	56	68	79	91	96	99	100						
MAY 07	17:15	12.0	93.2		75.0		DH59	216		492														
MAY 08	17:15	12.0	81.0		75.0		DH59	208														5	50	45
MAY 09	14:50	11.0	13.6		125	M	DH59	203		504	26	45	68	77	93	95	98	99	100			6	51	43
MAY 09	15:00	11.0	16.6		100	M	DH59	207		505	34	47	68	82	94	98	99	100				5	51	44
MAY 09	15:05	11.0	14.7		75.0	M	DH59	204		495	26	43	62	76	90	94	96	99	100			35	38	27
MAY 09	15:15	11.0	14.6		60.0	M	DH59	203		497	21	37	50	58	62	65	68	83	99	100		3	51	46
MAY 09	15:20	11.0	12.6		40.0	M	DH59	196		500	34	46	66	82	91	97	97	100						
MAY 09	15:30	11.0	65.8		75.0		DH59	176																
MAY 10	17:30	12.5	57.2		75.0		DH59	146																
MAY 12	20:30	13.0	54.9		75.0		DH59	121																
MAY 14	20:30	11.0	46.5		75.0		DH59	108		485														
MAY 16	17:30	11.0	50.4		75.0		DH59	106																
MAY 18	20:00	11.0	54.9		75.0		DH59	116																
MAY 20	16:30	14.0	54.4		75.0		DH59	112																
MAY 22	19:40	14.5	48.4		75.0		DH59	102		457														
MAY 24	20:30	17.0	48.1		75.0		DH59	67		531														
MAY 31	20:15	17.0	50.7		75.0		DH59	65																
JUN 02	20:30	17.0	52.2		75.0		DH59	61																
JUN 04	20:30	17.0	49.8		75.0		DH59	60																
JUN 06	20:15	17.0	47.4		75.0		DH59	104		543														
JUN 08	20:30	17.0	51.6		75.0		DH59	123		528														
JUN 10	20:45	20.5	43.4		75.0		DH59	114																
JUN 14	10:30	20.0	42.4		75.0		DH59	113																
JUN 14	21:30	19.0	40.4		75.0		DH59	115																
JUN 16	21:15	20.0	40.4		75.0		DH59	112																
JUN 18	21:30	22.0	38.4		75.0		DH59	124		504														
JUN 20	21:00	23.0	39.6		75.0		DH59	119																
JUN 22	21:30	24.0	40.0		75.0		DH59	117																
JUN 24	21:45	24.0	37.7		75.0		DH59	117		510														
JUN 27	21:45	24.0	40.5		75.0		DH59	128																
JUN 29	21:45	24.0	42.1		75.0		DH59	115		496														
JUL 01	16:00	25.0	39.6		75.0		DH59	151		489														
JUL 10	11:15		33.8		75.0		DH59	185																
JUL 13	12:10	23.0	33.4		75.0		DH59	182		511														
JUL 17	18:00	23.0	32.2		75.0		DH59	167																
JUL 23	16:30	23.5	30.2		75.0		DH59	115		505														
JUL 28	20:00	24.0	25.6		75.0		DH59	135																
AUG 02	21:45	24.5	24.6		75.0		DH59	100		553														
AUG 14	08:45	19.0	21.3		75.0		DH59	71																
AUG 15	20:15	21.0	22.2		75.0		DH59	60																
AUG 20	20:30	21.0	18.2		75.0		DH59	77		541														
AUG 26	20:30	21.0	20.3		75.0		DH59	68																
AUG 29	19:45	21.0	16.5		75.0		DH59	64		502														
SEP 02	18:00	20.0	13.7		75.0		DH59	51		497														
SEP 09	13:15	17.0	11.6		75.0		DH59	50																
SEP 13	17:40	16.0	8.54		75.0		DH59	70		514														
SEP 18	17:00	15.0	8.65		75.0		DH59	71																
SEP 25	17:30	12.0	9.90		75.0		DH59	71		503														
SEP 30	14:00	7.0	26.5		75.0		DH59	78		521														
OCT 29	17:45	6.0	12.3		75.0		DH59	75	C															
OCT 29	17:15	5.5	14.7		75.0		DH59	19		483														
OCT 31	12:55	4.0	17.3		75.0		DH59																	

NOTE: SINGLE VERTICAL IS LOCATED AT 75.0 METRES FOR 1990

DISCHARGE SYMBOL(S): B - ICE CONDITIONS
CONCENTRATION SYMBOL(S): C - COARSE MATERIAL PRESENT
VERTICAL SYMBOL(S): M - A SEDIMENT MEASUREMENT VERTICAL
X - NOT AT REGULAR SINGLE SAMPLE VERTICAL

MANITOBA

ASSINIBOINE RIVER AT HEADINGLEY - STATION NO. 05MJ001

HISTORICAL SEDIMENT DATA SUMMARY

SUMMARY : MAR-OCT

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1956	---PCP------	MANUAL	870	APR 25	110	MAY 31	40 200	APR 26	644 000	---	---	---
1957	---PCC------	MANUAL	1 170	MAY 2	170	JUN 23	24 100	MAY 2	630 000	---	---	---
1958	---P--------	MANUAL	2 500 *	APR 6	125	APR 29	---	---	---	---	---	---
1959	---P--------	MANUAL	1 890	APR 15	205	APR 30	---	---	---	---	---	---
1961	---P--CCCCCC	MANUAL	810	APR 19	13	AUG 21	3 530	APR 19	17 500	---	---	---
1962	CCCCCCCCCCCC	MANUAL	1 410	APR 24	15	JAN 26	37 300	APR 24	283 000	1 140	1 140	---
1963	CCCCCCCCCCCC	MANUAL	1 480	APR 11	40	MAR 25	18 200	APR 11	257 000	1 030	1 080	5.1
1964	CCCCCCCCCCCC	MANUAL	1 490	APR 18	15	APR 2	29 400	APR 18	320 000	1 270	1 150	6.0
1965	CCCCCCCCCCCC	MANUAL	1 370	APR 18	10	NOV 13	37 200	APR 18	596 000	2 380	1 450	21.5
1966	CCCCCCCCCCCC	MANUAL	990	APR 13	20	FEB 13	52 900	APR 13	532 000	2 130	1 590	14.5
1967	CCCCCCCCCCCC	MANUAL	1 190	APR 23	14	DEC 1	55 200	APR 20	414 000	1 660	1 600	16.2
1968	CCCCCCCCCCCC	MANUAL	1 000	APR 12	7	NOV 14	12 000	APR 11	161 000	673	1 460	16.6
1969	CCCCCCCCCCCC	MANUAL	2 110	APR 16	3	MAR 22	56 900	APR 17 *	887 000	3 570	1 720	19.4
1970	CCCCCCCCCCCC	MANUAL	1 100	APR 29	24	OCT 2	24 600	APR 30	577 000	2 250	1 780	16.8
1971	CCCCCCCCCCCC	MANUAL	835	APR 17	28	MAR 26	9 960	APR 17	409 000	1 530	1 760	15.3
1972	CCCCCCCCCCCC	MANUAL	1 710	APR 28	13	AUG 26	13 900	MAY 3	548 000	2 090	1 790	13.7
1973	CCCCCCCCCCCC	MANUAL	486	APR 4	35	FEB 12	2 320	APR 5	81 200	319	1 660	15.6
1974	CCCCCCCCCCCC	MANUAL	1 680	APR 23	54	DEC 29	49 400	APR 23	844 000	3 340	1 790	15.2
1975	CCCCCCCCCCCC	MANUAL	1 390	MAY 3	40	APR 10	21 600	MAY 3	835 000	3 220	1 890	14.3
1976	CCCCCCCCCCCC	MANUAL	1 220	APR 15	41	FEB 7	36 200	APR 15	1 090 000 *	4 320	2 050	14.6
1977	CCCCCCCCCCCC	MANUAL	204	APR 13	11	MAR 15	1 030	APR 13	46 700	117	1 930	15.8
1978	CCCCCCCCCCCC	MANUAL	600	MAY 5	79	OCT 30	14 200	APR 21	232 000	849	1 870	15.7
1979	CCCCCCCCCCCC	MANUAL	1 180	APR 21	30	NOV 9	26 300	APR 26	1 020 000	4 120	1 990	15.3
1980	CCCCCCCCCCCC	MANUAL	911	APR 15	24	NOV 16	7 290	APR 17	106 000	352	1 910	15.7
1981	CCCCCCCCCCCC	MANUAL	306	APR 6	10	FEB 21	1 190	APR 2	35 700	120	1 800	16.4
1982	CCCCCCCCCCCC	MANUAL	1 520	APR 18	8	MAR 28	28 100	APR 18	265 000	1 020	1 780	16.1
1983	CCCCCCCCCCCC	MANUAL	1 070	APR 19	30	DEC 31	17 800	APR 19	465 000	1 760	1 780	15.4
1984	CCCCCCCCCCCC	MANUAL	859	JUN 20	10	MAR 22	3 540	JUN 22	91 500	344	1 720	15.6
1985	CCCCCCCCCCCC	MANUAL	1 500	JUN 13	28	NOV 26	18 000	APR 11	339 000	1 320	1 700	15.1
1986	CCCCCCCCCCCC	MANUAL	1 080	APR 5	14	OCT 3	24 900	APR 5	416 000	1 740	1 700	14.5
1987	--CCCCCCCC--	MANUAL	1 490	APR 9	31	OCT 31	23 800	APR 9	244 000	995	1 670	14.3
1988	--CCCCCCCP-	MANUAL	348	JUL 6	9	NOV 2	2 000	MAY 20	113 000	459	1 630	14.4
1989	--CCCCCCCC--	MANUAL	769	APR 22	14	OCT 31	5 850	APR 22	63 100	258	1 580	14.6
1990	--CCCCCCCC--	MANUAL	577	APR 19	19	OCT 31	8 770	APR 19	142 000	581	1 540	14.6

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH

P - PARTIAL MONTH

* - EXTREME FOR PERIOD OF RECORD

MANITOBA

ASSINIBOINE RIVER NEAR HOLLAND - STATION NO. 05MH005

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 49 41 54 N LONG 098 53 56 W
DRAINAGE AREA: 152 000 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 144 000 TONNES FOR THE PERIOD APR 01 TO OCT 31

REMARKS: BEG 1987 NOV DEC JAN & FEB SAMPLED ONLY ABOVE SPECIFIED FLOWS

	APR			MAY			JUN			
DAY	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	40.0 B	55	190	115	453 S	4 500	46.5	73	293	1
2	75.2 B	89	578	110	429 S	4 080	47.4	77	315	2
3	91.9 B	182	1 450	103	352 S	3 130	46.9	82	332	3
4	91.9 B	171	1 360	93.6	308 S	2 490	45.2	80	312	4
5	96.3 B	142	1 180	83.5	277 S	2 000	43.5	77	289	5
6	87.7 B	139	1 050	74.2	261 S	1 670	42.0	76	276	6
7	83.4 B	135	973	66.7	231 S	1 330	41.1	76	270	7
8	79.6 B	123	846	64.5	185 S	983	48.9	89	376	8
9	87.2 B	137	1 030	57.7	173 S	862	46.3	90 S	360	9
10	92.5 B	136 S	1 090	54.9	157 S	745	41.7	87	313	10
11	93.5 B	193 S	1 560	51.7	147 S	657	40.5	86	301	11
12	95.9 B	289	2 390	48.2	134	558	38.7	85 S	284	12
13	89.5 B	390 S	3 020	45.7	118	466	37.7	83	270	13
14	89.0 B	388 S	2 980	43.2	107 S	399	37.5	78	253	14
15	120 B	442 S	4 580	41.1	105	373	37.6	76	247	15
16	146 B	483 S	6 090	44.4	115	441	37.5	75 S	243	16
17	139 B	540 S	6 490	49.8	148 S	637	37.1	75	240	17
18	125 B	591 S	6 380	54.6	164	774	37.0	75 S	240	18
19	135 B	601 S	7 010	51.1	125 S	552	38.5	77	256	19
20	110 A	459 S	4 360	47.8	108	446	38.4	80	265	20
21	101 E	409 S	3 570	45.5	102 S	401	37.8	80	261	21
22	92.2 E	337 S	2 680	44.1	97	370	37.5	80 S	259	22
23	86.0 A	315 S	2 340	42.1	90 S	327	39.5	80	273	23
24	89.0	350 S	2 690	41.0	84	298	43.7	86	325	24
25	97.0	384 S	3 220	40.6	78 S	274	45.2	91 S	355	25
26	104	403 S	3 620	42.7	78	288	46.2	96 S	383	26
27	107	440 S	4 070	46.6	82	330	45.6	100 S	394	27
28	112	455 S	4 400	49.2	85 S	361	44.5	96	369	28
29	116	453 S	4 540	49.2	85	361	43.8	90	341	29
30	115	451 S	4 480	47.8	82 S	339	42.9	85	315	30
31				47.1	76 S	309				31
TOTAL	2 987.8		90 217	1 793.6		30 751	1 256.7		9 010	

	JUL			AUG			SEP			
DAY	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	41.6	80 S	288	28.5	76	187	16.9	44	64.2	1
2	40.3	80	279	28.3	76	186	16.7	43 S	62.0	2
3	40.9	80 S	283	27.4	76 S	180	16.2	41	57.4	3
4	39.8	81	279	26.8	74	171	14.9	34 S	43.8	4
5	38.0	81	266	27.0	72	168	14.0	31	37.5	5
6	37.1	86 S	276	26.5	69	158	13.6	30	35.2	6
7	36.6	93	294	25.5	67	148	13.2	28	31.9	7
8	36.2	96	300	25.1	64 S	139	12.7	26	28.5	8
9	35.8	101	312	23.9	62	128	12.2	24	25.3	9
10	35.1	106	321	23.5	61	124	11.8	23	23.4	10
11	33.9	114 S	334	23.3	60	121	11.7	21 S	21.2	11
12	33.0	118	336	23.8	58 S	119	11.3	18	17.6	12
13	32.8	121	343	23.2	63	126	11.2	16	15.5	13
14	33.2	124	356	22.1	71 S	136	11.1	14 S	13.4	14
15	33.3	127	365	21.2	71	130	10.7	14	12.9	15
16	33.3	128 S	368	20.8	63	113	10.8	13	12.1	16
17	34.0	121	355	20.4	56 S	98.7	14.7	18	22.9	17
18	33.6	109	316	20.3	54	94.7	15.5	22	29.5	18
19	33.9	100 S	293	20.5	52	92.1	13.1	21	23.8	19
20	33.8	96	280	21.2	51 S	93.4	11.8	20	20.4	20
21	32.9	93	264	24.7	66	141	11.4	19 S	18.7	21
22	32.4	91	255	23.6	74 S	151	10.9	18	17.0	22
23	31.7	88	241	22.3	68	131	11.1	18	17.3	23
24	31.4	85 S	231	20.6	62	110	11.4	17 S	16.7	24
25	31.0	83	222	19.2	54	89.6	11.6	17	17.0	25
26	30.6	81	214	18.4	49	77.9	11.8	17	17.3	26
27	30.7	80	212	17.2	45 S	66.9	11.5	16	15.9	27
28	30.7	79	210	16.6	44	63.1	11.2	16	15.5	28
29	30.8	78	208	17.0	45	66.1	11.1	16 S	15.3	29
30	30.3	76 E	199	17.0	47 S	69.0	11.8	16	16.3	30
31	28.7	76	188	17.3	46	68.8				31
TOTAL	1 057.4		8 688	693.2		3 747	377.9		766	

A - MANUAL GAUGE B - ICE CONDITIONS E - ESTIMATED S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

ASSINIBOINE RIVER NEAR HOLLAND - STATION NO. 05MH005

SUSPENDED SEDIMENT FOR 1990

DAY	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	NOV DAILY DISCHARGE (m^3/s)	NOV MEAN CONCENTRATION (mg/L)	NOV DAILY LOAD (t)	DEC DAILY DISCHARGE (m^3/s)	DEC MEAN CONCENTRATION (mg/L)	DEC DAILY LOAD (t)	DAY
1	12.7	17	18.6							1
2	12.9	17	18.9							2
3	12.8	15	16.6							3
4	12.3	14	14.9							4
5	12.1	13	13.6							5
6	12.2	13 S	13.7							6
7	12.2	13	13.7							7
8	12.2	13	13.7							8
9	13.1	13 S	14.7							9
10	14.5	18	22.5							10
11	15.2	19	25.0							11
12	15.3	18 S	23.8							12
13	15.5	19	25.4							13
14	15.8	25	34.1							14
15	15.7	28	38.0							15
16	15.6	32	43.1							16
17	15.5	32 S	42.8							17
18	14.9	30	38.6							18
19	15.1	25	32.6							19
20	14.8	20	25.6							20
21	14.5	17	21.3							21
22	15.0	17	22.0							22
23	16.2	17 S	23.8							23
24	16.7	18	26.0							24
25	17.0	20	29.4							25
26	17.4	21	31.6							26
27	19.4	24	40.2							27
28	20.3	29	50.9							28
29	20.9	30	54.2							29
30	20.8	28	50.3							30
31	21.2	27	49.5							31
TOTAL	479.8		889							

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

ASSINIBOINE RIVER NEAR HOLLAND - STATION NO. 05MH005

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)	SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
APR 10	14:00	1.0	89.3	B MID	DH59	133	386														
APR 11	13:00	1.0	90.4	B MID	DH59	197															
APR 13	11:00	2.0	73.2	B MID	DH59	398															
APR 14	13:00	3.0	87.3	B MID	DH59	383															
APR 15	11:00	4.0	115	B MID	DH59	440															
APR 16	13:00	3.0	140	B MID	DH59	485															
APR 17	10:00	3.0	148	B MID	DH59	538	301														
APR 18	09:30	4.0	130	B MID	DH59	568															
APR 18	10:00	4.0	131	B MID	DH59	597	328														
APR 19	10:00	5.0	140	B MID	DH59	629	396	10	23	34	56	72	77	82	93	99	100		23	54	23
APR 20	09:00	6.0	110	V MID	DH59	459															
APR 21	11:00	10.0	101	Y MID	DH59	418															
APR 22	11:00	11.0	92.2	Y MID	DH59	332															
APR 23	10:00	13.0	86.0	V MID	DH59	311															
APR 24	17:00	15.0	90.6	MID	DH59	361															
APR 25	15:00	12.0	98.2	MID	DH59	389															
APR 26	18:00	9.0	105	MID	DH59	408	544														
APR 27	15:00	7.0	108	MID	DH59	448															
APR 28	15:00	6.0	113	MID	DH59	457															
APR 29	13:00	7.0	116	MID	DH59	453	479	24	36	61	74	81	84	88	97	100			16	48	36
APR 30	15:00	8.0	115	MID	DH59	451															
MAY 01	11:00	8.0	115	MID	DH59	455															
MAY 02	10:00	7.0	110	MID	DH59	440	469														
MAY 03	09:30	8.0	105	MID	DH59	355	489	26	39	63	74	83	85	88	96	100			15	46	39
MAY 04	10:00	9.0	94.6	MID	DH59	312															
MAY 05	08:00	9.0	85.1	MID	DH59	278															
MAY 06	10:30	12.0	74.7	MID	DH59	264															
MAY 07	15:00	13.0	65.8	MID	DH59	229															
MAY 08	10:00	11.0	61.8	MID	DH59	183															
MAY 09	19:00	11.0	56.7	MID	DH59	172	477														
MAY 10	08:30	10.0	55.5	MID	DH59	157															
MAY 11	13:00	11.0	51.7	MID	DH59	147															
MAY 14	16:00	15.0	42.8	MID	DH59	105	466														
MAY 17	15:00	9.0	50.1	MID	DH59	156	432														
MAY 19	10:00		51.3	MID	DH59	122															
MAY 21	09:30		45.6	MID	DH59	103															
MAY 23	13:00		42.1	MID	DH59	89															
MAY 25	17:00		40.8	MID	DH59	77	509														
MAY 28	10:00		49.3	MID	DH59	87															
MAY 28	11:30	19.0	49.5	MID	DH59	85															
MAY 30	19:00	21.0	47.6	MID	DH59	81	512														
MAY 31	11:00	19.0	47.2	MID	DH59	75															
JUN 09	18:00	21.0	44.3	MID	DH59	88															
JUN 12	11:00	22.0	38.7	MID	DH59	86	492														
JUN 16	10:00	22.0	37.6	MID	DH59	75															
JUN 18	15:00	23.0	37.1	MID	DH59	75	504														
JUN 22	17:00	23.0	37.4	MID	DH59	80	483														
JUN 25	10:30	25.0	45.5	MID	DH59	90															
JUN 27	11:00	24.0	46.0	MID	DH59	100															
JUL 01	09:00	24.0	41.7	MID	DH59	80	507														
JUL 03	09:00	23.0	42.3	MID	DH59	80															
JUL 06	16:00	20.0	37.4	MID	DH59	89															
JUL 11	18:00	23.0	33.7	MID	DH59	116	459														
JUL 16	11:00	25.0	33.1	MID	DH59	128															
JUL 16	12:00	24.0	33.1	MID	DH59	130	494														
JUL 19	19:00	23.0	34.0	MID	DH59	98															
JUL 24	18:00	25.0	31.4	MID	DH59	85															
JUL 30	11:30	22.0	30.3	MID	DH59	76	509														
AUG 03	13:00	25.0	27.3	MID	DH59	76															
AUG 08	10:00	23.0	25.2	MID	DH59	64	510														
AUG 12	10:00	24.0	23.8	MID	DH59	58															
AUG 14	11:00	21.0	26.1	MID	DH59	72															
AUG 17	15:00	21.0	20.4	MID	DH59	55	551														
AUG 20	18:00	23.0	21.3	MID	DH59	50															
AUG 22	11:30	24.0	23.5	MID	DH59	74	518														
AUG 27	11:30	21.0	17.2	MID	DH59	45															
AUG 30	13:00	22.0	17.0	MID	DH59	47	491														
SEP 02	10:00	19.0	16.7	MID	DH59	43															
SEP 04	15:00	23.0	14.8	MID	DH59	33															
SEP 11	10:00	19.0	11.7	MID	DH59	21	509														
SEP 14	10:00	13.0	11.1	MID	DH59	14															
SEP 21	18:00	13.0	11.3	MID	DH59	19	514														
SEP 24	09:00	12.0	11.3	MID	DH59	17															
SEP 29	13:00	9.0	11.1	MID	DH59	16	524														
OCT 06	17:00	9.0	12.1	MID	DH59	13	510														
OCT 09	10:00	5.0	13.1	MID	DH59	13	507														
OCT 12	15:00	6.0	15.3	MID	DH59	18	494														
OCT 17	16:00	5.0	15.4	MID	DH59	32	484														
OCT 23	16:00	7.0	16.5	MID	DH59	17															

NOTE: SINGLE VERTICAL LOCATED AT MID (MID STREAM) FOR 1990

DISCHARGE SYMBOL(S): B - ICE CONDITIONS V - DAILY MEAN; MANUAL GAUGE Y - DAILY MEAN; ESTIMATED

ASSINIBOINE RIVER NEAR HOLLAND - STATION NO. 05MH005

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)		SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1970	-------CCCCC-	MANUAL	743	JUL 28	16	OCT 12	6 310	JUL 28	112 000		---	---	---
1971	---CCCCCC---	MANUAL	1 420	APR 17	29	SEP 17	22 800	APR 17	486 000		---	---	---
1972	---CCCCCCCC-	MANUAL	1 300	APR 16	25	AUG 20	25 300	APR 19	701 000		---	---	---
1973	---CCCCCC---	MANUAL	455	JUL 6	39	APR 30	1 070	JUL 6	39 000		---	---	---
1974	CCCCCCCCCCCC	MANUAL	1 580	APR 19	8	FEB 7	98 800	APR 20 *	1 320 000		5 320	5 320	---
1975	CCCCCCCCCCCC	MANUAL	1 340	APR 21	23	JAN 4	38 300	APR 30	1 340 000		5 370	5 340	0.4
1976	CCCCCCCCCCCC	MANUAL	1 360	APR 10	22	JAN 7	96 400	APR 12	1 910 000	*	7 700	6 130	12.8
1977	CCCCCCCCCCCC	MANUAL	149	JUL 14	14	FEB 26	529	JUL 13	44 700		122	4 630	34.6
1978	CCCCCCCCCCCC	MANUAL	1 280	APR 9	15	JAN 20	14 500	APR 9	169 000		631	3 830	38.5
1979	CCCCCCCCCCCC	MANUAL	2 890	APR 22	24	SEP 27	76 100	APR 23	1 630 000		6 630	4 300	30.1
1980	CCCCCCCCCCCC	MANUAL	701	APR 14	17	DEC 21	4 970	APR 17	73 700		255	3 720	33.2
1981	CCCCCCCCCCCC	MANUAL	234	AUG 26	20	JAN 2	493	AUG 26	33 100		99.4	3 270	35.6
1982	CCCCCCCCCCCC	MANUAL	1 900	APR 15	6	OCT 18 *	37 000	APR 16	314 000		1 220	3 040	34.5
1983	CCCCCCCCCCCC	MANUAL	1 250	APR 21	21	DEC 31	29 700	APR 11	575 000		2 280	2 960	31.8
1984	CCCCCCCCCCCC	MANUAL	226	JUL 10	11	SEP 25	969	APR 6	49 600		177	2 710	32.8
1985	CCCPCCCCCCCC	MANUAL	3 740	APR 30 *	17	NOV 27	12 100	APR 13	297 000		---	---	---
1986	CCCCCCCCCCCC	MANUAL	1 040	APR 5	11	SEP 24	21 000	APR 5	424 000		1 690	2 630	31.1
1987	--CCCCCCCCC-	MANUAL	1 410	APR 6	8	SEP 29	39 800	APR 6	306 000		1 240	2 520	30.1
1988	--CCCCCCCC--	MANUAL	751	APR 13	10	OCT 13	4 050	APR 13	125 000		510	2 380	30.1
1989	--CCCCCCCP-	MANUAL	643	APR 17	8	OCT 6	5 760	APR 6	55 200		224	2 230	30.5
1990	---CCCCCC--	MANUAL	629	APR 19	13	OCT 6	7 010	APR 19	144 000		---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

ASSINIBOINE RIVER NEAR PORTAGE LA PRAIRIE - STATION NO. 05MJ003

LOCATION: LAT 49 56 09 N LONG 098 16 48 W
DRAINAGE AREA: 152 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: MANUAL

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)		SUMMARY : JAN-DEC MEAN LOAD (TONNES)	SUMMARY : JAN-DEC HISTORICAL MEAN LOAD (TONNES)	SUMMARY : JAN-DEC STANDARD ERROR OF MEAN %
1956	---PC--------	MANUAL	1 200	APR 20	305	MAY 4	63 800	APR 21	913 000		---	---	---
1957	---PCC-------	MANUAL	1 180	APR 27	160	JUN 11	20 600	MAY 8	622 000		---	---	---
1958	---P---------	MANUAL	1 900	APR 10	120	APR 26	---	---	---		---	---	---
1959	---P---------	MANUAL	1 180	APR 10	80	APR 29	---	---	---		---	---	---
1961	---P---------	MANUAL	430	APR 19	160	APR 28	---	---	---		---	---	---
1962	---PCCCCCCCC	MANUAL	895	AUG 24	50	SEP 24	8 060	APR 24	137 000		---	---	---
1963	CCCCCCCCCCCC	MANUAL	3 080	APR 15 *	10	DEC 4	22 100	APR 11	263 000		720	720	---
1964	CCCCCCCCCCCC	MANUAL	1 510	SEP 3	8	APR 2	15 800	APR 18	293 000		801	761	5.3
1965	CCCCCCCCCCCC	MANUAL	1 650	APR 16	80	SEP 26	62 600	APR 16	620 000		1 700	1 070	29.2
1966	CCCCCCCCCCCC	MANUAL	2 600	APR 11	13	FEB 15	37 700	APR 11	611 000		1 670	1 220	21.9
1967	CCCCCCCCCCCC	MANUAL	1 770	APR 28	14	OCT 22	20 600	APR 23	432 000		1 180	1 220	17.1
1968	CCCCCCCCCCCC	MANUAL	986	APR 8	6	NOV 20	8 690	APR 8	152 000		414	1 080	19.9
1969	CCCCCCCCCCCC	MANUAL	1 990	APR 23	5	APR 3 *	103 000	APR 23 *	1 190 000		3 250	1 390	25.8
1970	CCCCCCCCCCCC	MANUAL	1 510	APR 23	21	MAR 26	25 000	MAY 17	497 000		1 360	1 390	22.4
1971	CCCCCCCCCCCC	MANUAL	1 800	APR 23	31	SEP 24	21 600	APR 23	282 000		772	1 320	21.4
1972	CCCCCCCCCCCC	MANUAL	731	APR 16	35	SEP 7	6 720	MAY 2	283 000		773	1 260	20.5
1973	CCCCCCCCCCCC	MANUAL	333	APR 2	22	SEP 25	1 780	APR 2	59 300		163	1 160	21.9
1974	CCCCCCCCCCCC	MANUAL	1 690	APR 22	34	OCT 18	51 300	APR 22	943 000		2 580	1 280	20.3
1975	CCCCCCCCCCCC	MANUAL	1 670	APR 24	31	APR 10	18 700	MAY 2	674 000		1 850	1 330	18.4
1976	CCCCCCCCCCCC	MANUAL	2 250	APR 9	36	FEB 24	51 800	APR 21	1 220 000	*	3 330	1 470	16.2
1977	CCCCCCCCCCCC	MANUAL	227	DEC 6	23	MAR 15	700	APR 11	48 900		134	1 380	19.1
1978	CCCCCCCCCCCC	MANUAL	980	APR 17	50	OCT 15	8 390	APR 17	155 000		426	1 320	19.2
1979	CCCCCCCCCCCC	MANUAL	818	MAY 6	66	JUN 28	18 000	APR 25	554 000		1 520	1 330	18.0

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

ASSINIBOINE RIVER NEAR ROSSENDALE - STATION NO. 05MJ005

LOCATION: LAT 49 45 32 N LONG 098 38 32 W
DRAINAGE AREA: 152 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : JAN-DEC MEAN LOAD (TONNES)	SUMMARY : JAN-DEC HISTORICAL MEAN LOAD (TONNES)	SUMMARY : JAN-DEC STANDARD ERROR OF MEAN %
1970	---PCCCCCCCC	MANUAL	1 810 APR 26 *	46 SEP 28	67 800 APR 27 *	812 000 *	---	---	---
1971	CCCCCCCCCCCC	MANUAL	1 530 APR 18	32 OCT 13	25 100 APR 18	707 000	1 940	1 940	---
1972	---CCCCCCC--	MANUAL	1 290 APR 17	22 OCT 20 *	23 700 APR 19	630 000	---	---	---
1973	P----------	MANUAL	76 JAN 16	76 JAN 16	--- ---	---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

ASSINIBOINE RIVER NEAR RUSSELL - STATION NO. 05ME001

LOCATION: LAT 50 48 35 N LONG 101 26 10 W
DRAINAGE AREA: 19 300 km²
TYPE OF FLOW: REGULATED SINCE 1969
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-OCT MEAN LOAD (TONNES)	SUMMARY : APR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : APR-OCT STANDARD ERROR OF MEAN %
1969	----CC------	MANUAL	118 MAY 4	5 JUN 2	482 MAY 4	2 550	---	---	---
1970	---CCCCCCC--	MANUAL	100 APR 27	11 AUG 26	482 APR 27	12 100	56.6	56.6	---
1971	---CCCCCCCC-	MANUAL	153 APR 1	1 SEP 17 *	416 MAY 14	5 500	23.8	40.2	40.8
1972	---CCCCCCCC-	MANUAL	395 APR 17	7 SEP 2	1 110 APR 17	16 600	74.5	51.6	28.7
1973	CCCCCCCCCCCC	MANUAL	50 SEP 4	3 APR 6	23.5SEP 4	1 820	3.86	39.7	40.0
1974	CCCCCCCCCCCC	MANUAL	133 APR 20	6 FEB 9	537 APR 20	19 000	82.0	48.2	31.0
1975	CCCCCCCCCCCC	MANUAL	115 APR 21	5 DEC 9	516 MAY 11	17 300	67.0	51.3	24.5
1976	---CCCCCCCCC	MANUAL	437 APR 9 *	1 DEC 12	1 220 APR 9 *	25 900 *	120	61.1	23.7

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

BURNTWOOD RIVER ABOVE THREE POINT LAKE - STATION NO. 05TE001

LOCATION: LAT 55 27 50 N LONG 099 06 00 W
DRAINAGE AREA: 6 660 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1972	-----PP-P---	MANUAL	310 SEP 8 *	18 JUL 21	--- ---	---	---	---	---
1977	----CCCCC---		93 MAY 28	15 SEP 29	1 040 MAY 28	32 700 *	---	---	---
1978	----PCCCC---		84 AUG 20	14 SEP 29	617 AUG 20	11 800	---	---	---
1979	----P-P-P---	MANUAL	105 MAY 25	16 SEP 25	--- ---	---	---	---	---
1980	----PCCPP---	AUTO	172 JUN 26	19 AUG 12	755 SEP 16	9 510	---	---	---
1981	----PCCCC---		51 MAY 22	17 AUG 1	323 MAY 22	9 920	---	---	---
1982	----PCCCC---		69 JUN 8	10 SEP 30 *	626 JUN 8	15 300	---	---	---
1983	----CCCCC---		82 MAY 20	15 AUG 31	822 MAY 20	27 300	---	---	---
1984	----PP-P----	MANUAL	53 JUN 21	28 AUG 22	--- ---	---	---	---	---

AUTO - AUTOMATIC SAMPLING MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

BURNTWOOD RIVER BELOW FIRST RAPIDS - STATION NO. 05TG004

LOCATION: LAT 56 05 13 N LONG 096 50 06 W
DRAINAGE AREA: 883 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1978	----PPPP----	MANUAL	47 JUN 28 *	29 AUG 28	--- ---	---	---	---	---
1979	------PP----	MANUAL	35 JUL 4	33 AUG 20	--- ---	---	---	---	---
1984	-----PP-P---	MANUAL	46 JUL 19	28 SEP 26 *	--- ---	---	---	---	---
1987	----P-------	MANUAL	33 MAY 27	33 MAY 27	--- ---	---	---	---	---

MANUAL - MANUAL SAMPLING
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

BURNTWOOD RIVER NEAR THOMPSON - STATION NO. 05TG001

LOCATION: LAT 55 44 40 N LONG 097 53 30 W
DRAINAGE AREA: 18 500 km²
TYPE OF FLOW: REGULATED SINCE 1973
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1970	--CCCCCCC---	AUTO	40 JUL 9	7 MAR 1	1 370 JUL 9	84 400	---	---	---
1971	-CCCCCCC---	AUTO	31 MAY 30	6 MAY 27	712 JUL 13	65 100	---	---	---
1972	----CCCCC---	AUTO	58 SEP 22	5 AUG 23 *	973 JUN 16	54 100	---	---	---
1973	----CCCC----	AUTO	33 AUG 8	6 MAY 1	489 MAY 22	31 300	---	---	---
1974	----CCCC----	AUTO	59 JUL 28	6 MAY 1	722 MAY 22	42 000	---	---	---
1975	----CCCCC---	AUTO	75 MAY 26 *	9 MAY 1	920 MAY 26	52 400	---	---	---
1976	----CCCCC---	AUTO	69 JUN 21	17 MAY 1	1 370 JUL 18	95 600 *	---	---	---
1977	----PPPPP---	MANUAL	44 AUG 30	18 MAY 24	--- ---	---	---	---	---
1978	----PP--P---	MANUAL	26 MAY 29	21 SEP 12	--- ---	---	---	---	---
1979	-----PP-----	MANUAL	36 JUN 5	28 JUL 17	--- ---	---	---	---	---
1981	-----PP-----	MANUAL	27 JUL 27	16 JUN 15	--- ---	---	---	---	---
1984	----P-PP----	MANUAL	44 MAY 15	21 MAY 15	--- ---	---	---	---	---
1987	----P-P-----	MANUAL	29 JUL 15	19 MAY 6	--- ---	---	---	---	---

AUTO - AUTOMATIC SAMPLING MANUAL - MANUAL SAMPLING
C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

CHURCHILL RIVER ABOVE LEAF RAPIDS - STATION NO. 06EB004

LOCATION: LAT 56 29 37 N LONG 100 02 55 W
DRAINAGE AREA: 244 000 km²
TYPE OF FLOW: REGULATED SINCE 1928
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1975	----P-P-----	MANUAL	10 JUL 15 *	0 MAY 0 *	--- ---	---	---	---	---

MANUAL - MANUAL SAMPLING
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

MANITOBA

EDWARDS CREEK DRAIN BELOW JACKFISH CREEK - STATION NO. 05LJ047

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 51 08 30 N LONG 099 55 20 W
DRAINAGE AREA: 311 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 33 000 TONNES FOR THE PERIOD MAR 01 TO OCT 31

	MAR			APR			MAY			
DAY	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	0 B	0	0	15.8 B	161 S	220	1.69	208 S	30.4	1
2	0 B	0	0	8.16B	162 S	114	1.80	89 S	13.8	2
3	0 B	0	0	10.8 B	210 S	196	1.98	94 S	16.1	3
4	0 B	0	0	7.52B	154 S	100	2.95	319 S	81.3	4
5	0 B	0	0	5.77B	221 S	110	3.94	514 S	175	5
6	0 B	0	0	2.19B	84 S	15.9	4.49	485 S	188	6
7	0 B	0	0	1.54B	92 S	12.2	4.36	378 S	142	7
8	0 B	0	0	1.33B	123 S	14.1	4.09	325 S	115	8
9	0 B	0	0	0.97B	72 S	6.08	3.57	271 S	83.6	9
10	0 B	0	0	0.88B	39 S	2.97	3.64	318 S	100	10
11	0 B	0 S	0	0.44B	33	1.27	3.94	371 S	126	11
12	0.15B	17 S	0.223	0.75B	42 S	2.73	3.56	319 S	98.1	12
13	1.52B	38 S	4.99	1.59B	148 S	20.3	2.60	166 S	37.3	13
14	4.39B	36 S	13.7	1.22B	69 S	7.27	2.04	104 S	18.3	14
15	0.22B	21 S	0.399	1.02B	65	5.73	1.77	90	13.8	15
16	0.01B	11	0.011	0.96B	64	5.35	17.9	4 340 S	6 710	16
17	0.01B	9	0.008	1.50B	82 S	10.6	21.3	2 940 S	5 410	17
18	0.00B	8	0.004	1.79B	100 S	15.5	10.5	1 440 S	1 310	18
19	0.00B	4	0.001	3.08	187 S	49.8	6.67	714 S	411	19
20	0 B	0	0	3.92	332 S	112	4.82	415 S	173	20
21	0 B	0	0	7.33	1 090 S	690	3.73	258 S	83.1	21
22	0 B	0	0	11.4	2 250 S	2 220	3.81	235 S	77.4	22
23	0 B	0	0	15.6	3 340 S	4 390	3.57	231 S	71.3	23
24	0 B	0	0	15.6	3 560 S	4 800	3.79	154 S	37.1	24
25	0 B	0	0	12.0	2 300 S	2 380	2.28	101 S	19.9	25
26	0 B	0	0	7.75	1 250 S	837	1.83	62 S	9.80	26
27	0 B	0	0	2.80B	432 S	105	1.53	40	5.29	27
28	0 B	0	0	1.51B	358 S	46.7	1.31	26 S	2.94	28
29	0 B	0	0	1.63B	477 S	67.2	1.16	21	2.10	29
30	0.55B	16 S	0.769	2.37B	482 S	98.7	1.03	14 S	1.25	30
31	4.23B	154 S	56.3				0.93	15	1.22	31
TOTAL	11.099		76	148.844		16 656	131.589		15 564	

	JUN			JUL			AUG			
DAY	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	1.52	88 S	11.6	0.34	8	0.237	0.04	10	0.038	1
2	2.47	140	29.9	0.30	10	0.267	0.03	10	0.029	2
3	1.60	35	4.84	0.40	17 S	0.593	0.03	10	0.034	3
4	1.22	28	2.95	0.46	10 S	0.402	0.01	8 S	0.012	4
5	1.34	23 S	2.66	0.49	9	0.383	0.00	4	0.001	5
6	1.60	23	3.18	0.52	12 S	0.540	0	0	0	6
7	1.21	30 S	3.14	1.05	23	2.09	0	0	0	7
8	1.40	1 050 S	308	1.01	19	1.66	0	0	0	8
9	1.88	574	192	0.77	17 S	1.14	0	0	0	9
10	2.25	43	8.36	0.49	14	0.604	0	0	0	10
11	1.54	36	4.79	0.33	14	0.410	0	0	0	11
12	1.17	34 S	3.44	0.28	13 S	0.325	0	0	0	12
13	0.98	23 S	1.96	0.25	13	0.265	0	0	0	13
14	0.89	13 S	1.00	0.22	12	0.232	0	0	0	14
15	0.79	13	0.893	0.21	12	0.218	0	0	0	15
16	0.74	12	0.772	0.20	11	0.191	0.00	15 S	0.003	16
17	0.59	10	0.516	0.33	15 S	0.433	0.00	6	0.001	17
18	0.59	9 S	0.459	0.35	16	0.484	0.00	2	0	18
19	0.59	7	0.361	0.23	12	0.238	0	0	0	19
20	1.67	139 S	20.0	0.19	9	0.150	0.00	3	0.002	20
21	1.99	171 S	29.4	0.26	10 S	0.226	0.00	2	0.001	21
22	1.23	52 S	5.53	0.17	10	0.154	0.02	9	0.018	22
23	0.80	36	2.50	0.16	9	0.126	0.01	6	0.007	23
24	0.65	25	1.42	0.16	10 S	0.141	0.00	1	0	24
25	0.52	19	0.867	0.17	10	0.155	0.03	20 S	0.067	25
26	0.45	15 S	0.583	0.13	10	0.113	0.05	16	0.082	26
27	0.40	16	0.556	0.10	9	0.083	0.05	13	0.060	27
28	0.47	21 S	0.856	0.07	9	0.056	0.05	10	0.046	28
29	0.47	20	0.817	0.05	9	0.040	0.05	12	0.059	29
30	0.39	10 S	0.340	0.04	11 S	0.041	0.04	9 S	0.034	30
31				0.04	10	0.035	0.02	8	0.020	31
TOTAL	37.469		644	9.884		12	0.529		1	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

EDWARDS CREEK DRAIN BELOW JACKFISH CREEK - STATION NO. 05LJ047

SUSPENDED SEDIMENT FOR 1990

DAY	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)	SEP DAILY LOAD (t)	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	0.01	7	0.010	0.02E	7	0.013				1
2	0	0	0	0.06E	9	0.047				2
3	0	0	0	0.15E	11	0.144				3
4	0	0	0	0.20E	13	0.229				4
5	0 A	0	0	0.22E	14	0.272				5
6	0 A	0	0	0.20E	13	0.235				6
7	0 A	0	0	0.18E	13	0.212				7
8	0 A	0	0	0.16E	13	0.189				8
9	0 A	0	0	0.12E	13	0.136				9
10	0 E	0	0	0.07E	13	0.080				10
11	0 E	0	0	0.04A	12 S	0.047				11
12	0 E	0	0	0.03E	11	0.029				12
13	0 E	0	0	0.02A	11	0.025				13
14	0 E	0	0	0.02E	11	0.027				14
15	0 E	0	0	0.02E	10	0.023				15
16	0 A	0	0	0.01E	8	0.012				16
17	0 A	0	0	0.01E	7	0.010				17
18	0 A	0	0	0.01E	7	0.008				18
19	0.01A	4	0.006	0.01E	8	0.012				19
20	0.05	14 S	0.069	0.06E	11	0.064				20
21	0.08	13	0.091	0.05E	11	0.056				21
22	0.04	13	0.052	0.04E	11	0.043				22
23	0.03	12	0.032	0.04E	11	0.038				23
24	0.01	11	0.018	0.03E	10	0.029				24
25	0.02	10	0.017	0.02E	10	0.024				25
26	0.02A	9	0.019	0.03A	10 S	0.029				26
27	0.02E	8	0.019	0.02E	9	0.021				27
28	0.02E	8	0.017	0.02E	9	0.016				28
29	0.02E	8	0.014	0.01E	10	0.014				29
30	0.02E	7	0.014	0.00E	10	0.008				30
31				0.00A	9 S	0.005				31
TOTAL	0.408		0	2.029		2				

A - MANUAL GAUGE E - ESTIMATED S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

EDWARDS CREEK DRAIN BELOW JACKFISH CREEK - STATION NO. 05LJ047

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)	SINGLE SAMPLING VERTICAL (m)		TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAR 11	15:50	0.5	0 W	WERB	X	SURF	14	521														
MAR 12	12:25	0.5	0.152W	WERB	X	SURF	14															
MAR 12	17:30	0.5	0.152W	WERB	X	SURF	17															
MAR 13	11:40	1.0	1.52 W	WERB	X	SURF	40															
MAR 13	14:00	0.5	1.52 W	WERB	X	SURF	42															
MAR 14	13:20	0.5	4.39 W	WERB	X	SURF	38	187														
MAR 15	10:30	0.5	0.220W	WERB	X	DIP	21															
MAR 30	11:05	1.5	0.556W	WERB	X	DIP	4															
MAR 30	11:06	1.5	0.556W	WERB	X	DIP	4															
MAR 30	19:15	0.5	0.556W	33.0		DH59	38															
MAR 31	08:15	0.5	4.23 W	33.0		DH59	93															
MAR 31	13:20	0.5	4.23 W	33.0		DH59	348	129	31	45	63	75	88	94	98	100				6	49	45
MAR 31	15:20	0.5	4.23 W	33.0		DH59	312	118														
MAR 31	15:21	0.5	4.23 W	33.0		DH59	204	112														
MAR 31	18:35	0.5	4.23 W	33.0		DH59	188															
MAR 31	18:36	0.5	4.23 W	33.0		DH59	200															
APR 01	11:05	0.5	13.6 B	WERB	X	DIP	27															
APR 01	14:45	0.5	10.9 B	33.0		DH59	287															
APR 02	14:20	0.5	14.5 B	33.0		DH59	171															
APR 02	18:50	0.5	12.2 B	33.0		DH59	151															
APR 03	08:50	0.5	6.67 B	33.0		DH59	84															
APR 03	10:05	0.5	6.63 B	33.0		DH59	91															
APR 03	16:15	0.5	14.0 B	33.0		DH59	481															
APR 04	10:10	0.5	5.04 B	WERB	X	DIP	29															
APR 04	16:00	0.5	9.40 B	WERB	X	DIP	291	199														
APR 05	14:40	0.5	6.31 B	33.0		DH59	216															
APR 06	11:27	0.5	1.56 B	33.0		DH59	69															
APR 06	11:28	0.5	1.57 B	33.0		DH59	67															
APR 06	11:45	0.5	1.67 B	33.0		DH59	72															
APR 07	11:32	1.0	1.42 B	33.0		DH59	101															
APR 08	12:45	0.5	1.31 B	33.0		DH59	151															
APR 09	13:20	1.0	1.24 B	33.0		DH59	78															
APR 10	16:15	1.0	0.940B	33.0		DH59	38	282														
APR 12	13:00	4.0	0.757B	33.0		DH59	45															
APR 13	16:10	3.5	2.06 B	33.0		DH59	476	226	26	29	57	74	91	97	98	100				3	68	29
APR 14	18:30	4.0	1.36 B	33.0		DH59	67															
APR 17	12:40	4.0	1.11 B	33.0		DH59	68															
APR 17	17:40	7.0	1.56 B	33.0		DH59	72															
APR 18	09:45	3.0	1.13	33.0		DH59	37															
APR 18	18:00	7.0	2.84	33.0		DH59	188															
APR 19	10:00	4.0	2.68	33.0		DH59	136															
APR 19	19:00	7.0	3.78	33.0		DH59	259															
APR 20	18:25	8.0	4.69	33.0		DH59	346	288	27	37	55	74	90	95	97	100				5	58	37
APR 21	11:30	5.0	6.87	33.0		DH59	1067	276	18	45	73	85	93	96	98	100				4	51	45
APR 21	12:00	5.0	6.89	33.0		DH59	1075	270	21	47	71	84	93	95	98	99	100			5	48	47
APR 21	16:45	7.0	7.85	33.0		DH59	1177															
APR 22	12:10	3.0	9.95	33.0		DH59	2002															
APR 22	19:00	7.0	10.2	33.0		DH59	2369	259	09	29	65	87	96	98	99	100				2	69	29
APR 23	08:20	2.0	15.1	33.0		DH59	3502	236	12	28	66	85	93	97	98	99	100			3	69	28
APR 23	12:00	5.0	13.8	33.0		DH59	2856															
APR 23	14:10	7.0	13.6	33.0		DH59	2775	247	21	47	66	81	93	97	99	100				3	50	47
APR 23	18:40	5.0	13.9	33.0		DH59	3110															
APR 24	07:40	3.0	17.1	33.0		DH59	3994	252	13	31	52	74	88	94	97	99	100			6	63	31
APR 24	15:30	8.0	13.7	33.0		DH59	3175	231	23	40	57	74	89	95	98	99	100			5	55	40
APR 24	18:15	8.0	13.9	33.0		DH59	3026	241	17	18	66	68	88	94	97	100				6	76	18
APR 25	10:20	3.5	11.7	33.0		DH59	2262	234	23	41	56	75	88	94	97	99	100			6	53	41
APR 25	13:30	4.0	11.0	33.0		DH59	2010															
APR 26	07:15	2.0	8.61	33.0		DH59	1657	230	30	41	60	72	89	96	98	99	100			4	55	41
APR 26	15:00	1.0	6.92	33.0		DH59	1177															
APR 27	08:30	0.5	2.80 W	WELB	X	DH48	405															
APR 29	15:15	0.1	1.63 W	WELB	X	DIP	510															
APR 30	14:15	1.5	2.37 W	33.0		DH59	446	309														
APR 30	14:16	1.5	2.37 W	33.0		DH59	449	312														
MAY 01	07:10	0.5	1.08	WERB	X	DIP	280															
MAY 01	14:20	6.0	1.73	33.0		DH59	134	344														
MAY 02	15:07	8.0	1.72	33.0		DH59	81															
MAY 03	11:40	6.0	1.82	33.0		DH59	92															
MAY 03	18:55	12.0	2.07	33.0		DH59	80															
MAY 04	09:10	10.0	2.91	33.0		DH59	236															
MAY 04	10:50	6.0	2.93	33.0		DH59	453	324	38	53	80	93	97	98	99	100				2	45	53
MAY 05	12:30	8.0	3.76	33.0		DH59	621	283	39	53	76	88	98	99	100					1	46	53
MAY 06	13:20	10.0	4.23	33.0		DH59	519	267	41	51	74	86	95	97	98	100				3	46	51
MAY 06	18:10	12.0	4.19	33.0		DH59	409	267	43	54	73	84	94	96	98	100				4	42	54
MAY 07	11:10	5.5	4.28	33.0		DH59	410															
MAY 07	18:25	5.0	4.04	33.0		DH59	315															
MAY 08	10:55	4.0	4.13	33.0		DH59	358															
MAY 08	15:50	4.0	3.99	33.0		DH59	307															
MAY 09	10:25	4.0	3.56	33.0		DH59	289															
MAY 09	16:25	10.0	3.24	33.0		DH59	334															
MAY 10	11:15	8.0	3.61	33.0		DH59	367	282	43	52	75	86	94	96	97	99	100			4	44	52
MAY 10	20:05	10.0	3.39	33.0		DH59	267	283														
MAY 11	14:45	11.0	4.39	33.0		DH59	519	280														
MAY 12	10:50	7.0	3.59	33.0		DH59	305	279														
MAY 12	18:50	12.0	3.05	33.0		DH59	225	285														
MAY 13	13:00	11.0	2.52	33.0		DH59	163	299														
MAY 14	16:00	12.0	1.92	33.0		DH59	95	315														
MAY 16	09:50	7.0	9.61	33.0		DH59	2395	342	10	14	27	44	66	79	85	93	99	100		21	65	14
MAY 16	15:20	7.0	13.7	33.0		DH59	4316															
MAY 16	15:25	6.0	22.7	33.0		DH59	7937															
MAY 16	19:20	5.0	16.8	33.0		DH59	8337	280	05	14	42	51	72	87	95	99	100			13	73	14
MAY 17	07:45	3.0	24.1	33.0		DH59	2903	269														
MAY 17	13:00	6.0	17.7	33.0		DH59	2154															
MAY 17	17:30	9.5	3.29	30.0	M	DH59	1811	271	31	39	57	67	81	89	94	99	100			11	50	39
MAY 17	17:31	9.5	3.29	30.0	M	DH59	1778	300	22	40	54	69	82	88	93	98	100			12	48	40
MAY 17	17:33	9.5	2.68	31.5	M	DH59	1743	277	33	37	64	72	83	91	96	99	100			9	54	37
MAY 17	17:38	9.5	3.22	34.0	M	DH59	1700	290	26	37	53	64	82	92	94	98	100			10	45	37
MAY 17	17:43	9.5	2.79	37.5	M	DH59	1745	290	28	38	55	66	80	87	91	98	100			13	49	38
MAY 17	17:50	9.5	3.12	40.0	M	DH59	1677	288	21	40	56	69	83	90	95	99	100			10	50	40
MAY 17	18:05	9.5	15.1	33.0		DH59	1651	288	25	40	56	67	82	86	93	98	100			14	46	40
MAY 18	09:30	6.0	10.9	33.0		DH59	1599															
MAY 18	18:00	12.0	8.81	33.0		DH59	1161															
MAY 19	13:15	8.0	6.36	33.0		DH59	712															
MAY 20	13:30	12.0	4.72	33.0		DH59	406															
MAY 21	11:15	12.0	3.64	33.0		DH59	263															
MAY 22	07:45	10.0	3.71	33.0		DH59	238															
MAY 22	13:30	11.5	3.73	33.0		DH59	234															
MAY 23	14:45	16.0	3.41	33.0		DH59	238	309	48	59	78	92	95	97	98	100				3	38	59
MAY 24	13:32	18.0	2.72	33.0		DH59	146															
MAY 25	18:00	19.0	2.13	33.0		DH59	90															

CONTINUED

EDWARDS CREEK DRAIN BELOW JACKFISH CREEK - STATION NO. 05LJ047 (CONTINUED)

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)	SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	PERCENT SILT	PERCENT CLAY
MAY 26	18:10	20.0	1.68	33.0	DH59	55															
MAY 28	14:47	18.5	1.30	33.0	DH59	24	363														
MAY 30	12:05	18.0	1.01	33.0	DH59	12															
MAY 30	12:06	18.0	1.01	33.0	DH59	13															
JUN 01	13:15	21.0	0.893	33.0	DH59	7															
JUN 05	19:05	14.0	1.33	33.0	DH59	19	366														
JUN 07	18:40	19.5	1.13	33.0	DH59	26															
JUN 08	17:10	16.5	5.07	33.0	DH59	1816	347	17	37	65	88	97	98	99	99	100			2	61	37
JUN 08	17:11	16.5	5.07	33.0	DH59	1747	329	31	47	72	88	95	98	98	100				2	51	47
JUN 12	19:45	22.0	1.06	33.0	DH59	34															
JUN 13	19:15	18.0	0.965	33.0	DH59	20	331														
JUN 14	10:10	16.0	0.899	33.0	DH59	14															
JUN 18	12:05	22.0	0.535	33.0	DH59	8															
JUN 20	15:15	17.0	1.86	33.0	DH59	187	312														
JUN 20	19:12	18.0	1.81	33.0	DH59	170															
JUN 21	10:15	16.5	2.03	33.0	DH59	215															
JUN 22	12:20	19.0	1.22	33.0	DH59	50															
JUN 26	19:10	26.0	0.450	33.0	DH59	14															
JUN 28	10:10	22.0	0.505	33.0	DH59	22	353														
JUN 30	18:20	28.0	0.365	33.0	DH59	8															
JUL 03	07:35	18.0	0.344	33.0	DH59	16															
JUL 04	18:50	17.0	0.432	33.0	DH59	9															
JUL 06	17:00	17.0	0.536	33.0	DH59	14	401														
JUL 09	18:25	25.0	0.680	33.0	DH59	16															
JUL 12	13:05	24.5	0.290	33.0	DH59	13															
JUL 17	07:40	19.0	0.298	33.0	DH59	14	374														
JUL 21	12:05	21.0	0.288	33.0	DH59	10															
JUL 24	17:30	29.0	0.154	33.0	DH59	10	409														
JUL 30	16:20	23.0	0.043	33.0	DH59	11	558														
AUG 16	14:30	21.0	0.005	33.0	DH59	24	1004														
AUG 25	08:00	19.0	0.030	33.0	DH59	21	1040														
AUG 30	17:00	24.0	0.047	33.0	DH59	8	515														
SEP 20	10:45	11.0	0.055	33.0	DH59	14	1188														
OCT 11	16:05	7.0	0.045V	33.0	DH59	12	599														
OCT 26	17:30	11.0	0.013V	33.0	DH59	10	504														
OCT 31	13:30	5.0	0.007V	33.0	DH59	9	577														

NOTE: SINGLE VERTICAL IS LOCATED AT 33 METRES FOR 1990

DISCHARGE SYMBOL(S): B - ICE CONDITIONS V - DAILY MEAN; MANUAL GAUGE W - DAILY MEAN; ICE CONDITIONS
VERTICAL SYMBOL(S): M - A SEDIMENT MEASUREMENT VERTICAL
X - NOT AT REGULAR SINGLE SAMPLE VERTICAL

EDWARDS CREEK DRAIN BELOW JACKFISH CREEK - STATION NO. 05LJ047

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1980	--CCCCCCCC--	MANUAL	819	APR 18	5	OCT 7	351	APR 19	1 610	8.03	8.03	---
1981	--CCCCCCCC--	MANUAL	3 890	JUN 15	3	JUL 25	995	JUN 15	6 080	25.5	16.8	52.2
1982	--CCCCCCCC--	MANUAL	1 810	MAY 18	0	MAR 1 *	2 080	APR 23	9 760	51.3	28.3	44.4
1983	--CCCCCCCC--	MANUAL	2 530	MAY 18	0	MAR 1	3 340	APR 25	21 200	106	47.8	44.8
1984	--CCCCCCCC--	MANUAL	2 140	MAY 11	4	MAR 29	740	MAY 11	4 490	24.4	43.1	40.0
1985	--CCCCCCCC--	MANUAL	2 130	APR 20	0	MAR 1	3 000	APR 20	18 100	81.6	49.5	31.2
1986	--CCCCCCCCP-	MANUAL	6 040	MAY 6	0	MAR 1	35 600	MAY 6 *	62 300 *	277	82.0	42.7
1987	--CCCCCCCCP-	MANUAL	2 070	APR 8	0	AUG 2	1 430	APR 8	5 690	24.5	74.8	41.6
1988	--CCCCCCCCP-	MANUAL	5 350	MAY 3	0	MAR 1	12 800	MAY 3	33 400	184	86.9	34.5
1989	--CCCCCCCC--	MANUAL	8 460	JUN 13 *	0	MAR 1	7 700	JUN 13	9 080	47.5	83.0	32.7
1990	--CCCCCCCC--	MANUAL	8 340	MAY 16	0	MAR 1	6 710	MAY 16	33 000	168	90.7	28.4

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

EDWARDS CREEK NEAR DAUPHIN - STATION NO. 05LJ022

LOCATION: LAT 51 07 30 N LONG 100 02 20 W
DRAINAGE AREA: 142 km^2
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1969	---PPPPPPP--	MANUAL	1 530	JUL 1	12	APR 10	---	---	---	---	---	---
1971	---CCCCCCC--	MANUAL	6 140	JUN 6	11	MAY 19	5 870	JUN 6	16 400	---	---	---
1972	--CCCCCCCC--	MANUAL	2 090	APR 21	0	AUG 28 *	1 330	APR 21	7 400	31.6	31.6	---
1973	--CCCCCCCC--	MANUAL	2 960	SEP 4	0	JUL 23	614	SEP 4	2 800	11.6	21.6	46.4
1974	--CCCCCCCC--	MANUAL	3 620	APR 27	0	MAR 1	6 340	APR 27	44 300	221	87.9	75.7
1975	--CCCCCCCCP-	MANUAL	17 100	SEP 19 *	0	MAR 1	151 000	SEP 19 *	209 000 *	1 140	351	76.1
1976	--CCCCCCCC--	MANUAL	9 230	JUN 14	5	MAR 1	26 200	JUN 14	85 300	348	350	59.1
1977	--CCCCCCCC--	MANUAL	7 710	JUL 12	8	MAR 1	7 260	JUL 12	19 600	80.1	305	57.3
1978	--CCCCCCCC--	MANUAL	3 820	APR 23	8	MAR 1	1 280	APR 23	9 690	39.5	267	57.1
1979	--CCCCCCCC--	MANUAL	9 550	MAY 17	5	OCT 27	21 900	MAY 17	77 400	316	273	48.4

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MANITOBA

ICELANDIC RIVER NEAR RIVERTON - STATION NO. 05SC002

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 50 57 35 N LONG 097 02 10 W
DRAINAGE AREA: 1 270 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 847 TONNES FOR THE PERIOD MAR 01 TO OCT 31

	MAR			APR			MAY			
DAY	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	0.08B	26	0.186	20.6 B	63	112	1.54	19 S	2.53	1
2	0.08B	26	0.180	27.3 B	43 S	101	1.41	18	2.19	2
3	0.07B	26	0.168	23.4 B	31 S	62.7	1.30	20 S	2.25	3
4	0.07B	26	0.168	20.6 B	30 S	53.4	1.20	17	1.76	4
5	0.07B	26	0.157	11.7 B	32	32.3	1.11	13 S	1.25	5
6	0.07B	26	0.157	11.0 B	49 S	46.6	1.02	12	1.06	6
7	0.06B	26	0.146	11.3 B	80 S	78.1	0.92	10 S	0.795	7
8	0.10B	26	0.225	9.05B	43 S	33.6	0.99	10	0.856	8
9	0.12B	26	0.281	7.27B	18 S	11.3	1.09	9 S	0.848	9
10	0.12B	26	0.281	6.07B	18 S	9.44	1.26	9	0.980	10
11	0.13B	26	0.303	5.52B	17 S	8.11	1.16	9 S	0.902	11
12	0.13B	26 S	0.303	4.76B	17 S	6.99	1.10	10	0.950	12
13	0.50B	26	1.12	3.99B	20 S	6.89	0.92	10 S	0.797	13
14	0.54B	26	1.21	3.71B	19 S	6.09	0.86	11	0.823	14
15	0.65B	26	1.46	3.70B	16	5.11	0.82	12	0.854	15
16	0.75B	26	1.68	3.72B	20 S	6.43	0.75	7	0.455	16
17	0.72B	26	1.63	3.61B	21 S	6.55	1.17	4 S	0.404	17
18	0.82B	27	1.92	3.40	18 S	5.13	2.46	13	2.76	18
19	0.81B	26	1.83	3.75	29 S	9.40	2.08	4 S	0.719	19
20	0.80B	26	1.81	3.69	40 S	12.8	1.77	2	0.306	20
21	0.89B	26	2.02	3.05	30 S	7.91	1.47	2	0.254	21
22	0.78B	26	1.77	2.56	26	5.75	1.28	4 S	0.442	22
23	0.67B	26	1.51	2.52	28 S	6.10	1.21	19 S	1.99	23
24	0.55B	26	1.25	2.14	27 S	4.99	1.55	33	3.48	24
25	0.41B	26	0.937	1.98	25 S	4.28	1.17	37 S	3.74	25
26	0.35B	26	0.786	2.59	21 S	4.70	1.10	33	3.14	26
27	0.30B	26	0.681	2.32	18 S	3.61	1.04	29 S	2.61	27
28	0.25B	26	0.573	1.92	18 S	2.99	0.95	54	1.99	28
29	0.28B	26	0.629	1.65	17 S	2.42	0.91	19 S	1.50	29
30	0.69B	27	1.62	1.55	18 S	2.41	0.88	18	1.37	30
31	5.66B	36 S	17.6				0.89	18 S	1.40	31
TOTAL	17.622		45	210.32		659	37.089		45	

	JUN			JUL			AUG			
DAY	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	0.89	18	1.40	1.09E	12 S	1.13	0.16	14	0.202	1
2	1.01	17 S	1.48	0.86E	7	0.526	0.30	13	0.347	2
3	1.13	17	1.66	0.59E	7 S	0.361	0.27	14 S	0.331	3
4	1.70	18 S	2.64	0.41A	9 S	0.337	0.19	15	0.250	4
5	1.54	17	2.26	0.51	8	0.354	0.14	15	0.183	5
6	1.28	14 S	1.55	0.85	8	0.589	0.16	13 S	0.180	6
7	1.35	21	2.45	1.06	8 S	0.733	0.13	12	0.139	7
8	1.20	28 S	2.90	1.10	8	0.760	0.08	16	0.112	8
9	1.29	15 S	1.67	1.15A	10	0.994	0.05	17 S	0.078	9
10	1.80	13	2.02	0.87E	11 S	0.831	0.02	14	0.034	10
11	1.69	16 S	2.34	0.68A	12	0.711	0.01	9	0.012	11
12	1.38	18 S	2.15	0.66	13	0.748	0.01A	6 S	0.008	12
13	1.20	23 S	2.38	0.55	13 S	0.620	0.02E	32	0.058	13
14	1.05	21	1.91	0.44	13	0.496	0.06E	60	0.316	14
15	0.86	14 S	1.04	0.37	12	0.386	0.04E	58 S	0.220	15
16	0.64	12	0.667	0.31A	11 S	0.303	0.02E	48	0.083	16
17	0.50	12 S	0.523	0.32	17	0.476	0.01A	43 S	0.067	17
18	0.36	14	0.407	0.32	30	0.837	0.02	34	0.065	18
19	0.29	12 S	0.301	0.32	36 S	1.01	0.02	22	0.055	19
20	0.48	11	0.460	0.36A	33	1.10	0.02	11 S	0.026	20
21	1.31	18 S	2.04	0.39	32	1.10	0.03	8	0.022	21
22	2.12	30	5.50	0.35	33 S	1.00	0.02	11	0.023	22
23	1.92	16 S	2.65	0.24	38	0.791	0.02	14	0.033	23
24	1.48	10	1.28	0.18	47	0.739	0.03	21	0.069	24
25	1.22	9 S	0.949	0.14	55 S	0.675	0.04	32	0.124	25
26	1.05	13	1.18	0.17	50	0.739	0.03	48 S	0.162	26
27	0.88	25 S	1.91	0.18	37	0.591	0.03	60	0.161	27
28	0.75	23	1.51	0.22	21 S	0.414	0.03	57	0.167	28
29	0.76	20	1.32	0.32	16	0.453	0.03	37 S	0.102	29
30	1.28A	27	2.99	0.25	15	0.336	0.03	20	0.059	30
31				0.24	14 S	0.290	0.03	17	0.048	31
TOTAL	34.447		54	15.658		20	2.182		4	

A - MANUAL GAUGE B - ICE CONDITIONS E - ESTIMATED S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

ICELANDIC RIVER NEAR RIVERTON - STATION NO. 05SC002

SUSPENDED SEDIMENT FOR 1990

DAY	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)		SEP DAILY LOAD (t)	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)		OCT DAILY LOAD (t)	DAILY DISCHARGE (m^3/s)	MEAN CONCENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	0.03	21	S	0.056	0.25	24	S	0.537				1
2	0.03	25		0.076	0.26	23		0.535				2
3	0.04	25		0.091	0.27	22		0.519				3
4	0.03	20	S	0.062	0.28	18		0.446				4
5	0.02	19		0.048	0.29	15		0.382				5
6	0.03	30		0.091	0.29	15		0.385				6
7	0.03	43	S	0.134	0.26	13	S	0.295				7
8	0.03	39		0.118	0.27	13		0.306				8
9	0.01	31		0.027	0.30	18		0.477				9
10	0.00	21		0.016	0.31	19	S	0.515				10
11	0.02	12	S	0.029	0.67	45		2.63				11
12	0.05	9		0.040	0.48	59		2.45				12
13	0.05	12		0.060	0.25	51	S	1.13				13
14	0.06	20	S	0.109	0.19	44		0.749				14
15	0.05	22		0.110	0.15	36		0.488				15
16	0.05	18		0.090	0.11	29	S	0.286				16
17	0.05	12	S	0.059	0.08	22		0.163				17
18	0.09	10		0.080	0.07	15		0.097				18
19	0.10	6		0.056	0.07	9	S	0.061				19
20	0.13	6	S	0.067	0.09	7		0.057				20
21	0.12	8		0.089	0.12	8	S	0.083				21
22	0.21	14		0.256	0.12	8		0.086				22
23	0.29	12	S	0.310	0.12	8		0.087				23
24	0.19	7		0.119	0.12	9		0.098				24
25	0.17	8		0.121	0.37	26		0.851				25
26	0.21	7		0.128	0.30	43		1.12				26
27	0.23	9	S	0.183	0.17	39		0.583				27
28	0.22	11		0.216	0.12	35	S	0.363				28
29	0.22	16		0.312	0.10	28		0.254				29
30	0.24	21		0.441	0.11	21		0.214				30
31					0.13	13		0.151				31
TOTAL	3.157			4	6.88			16				

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

ICELANDIC RIVER NEAR RIVERTON - STATION NO. 05SC002

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)	SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAR 12	12:30	0.5	0.135W	MID	DIP	26															
MAR 31	16:45	0.5	8.97	MID	DH48	35	194														
APR 02	19:00	0.0	27.8	17.0	DH59	57	165														
APR 03	17:00	0.5	21.3	MID	DH48	38	179														
APR 03	19:00	1.0	21.9	17.0	DH59	51															
APR 04	19:00	0.0	19.4	17.0	DH59	51															
APR 06	14:30	0.5	12.5	MID	DH59	49	201														
APR 07	19:00	0.0	11.5	17.0	DH59	75															
APR 08	19:00	1.0	7.96	17.0	DH59	32															
APR 09	19:00	1.0	6.47	17.0	DH59	15															
APR 10	15:30	1.0	5.65	17.0	DH59	18															
APR 11	18:00	0.0	5.00	17.0	DH59	16															
APR 12	18:00	0.0	4.31	17.0	DH59	17	250														
APR 13	18:00	0.0	3.74	---	DIP	20															
APR 13	18:01	0.0	3.74	---	DIP	21															
APR 14	18:00	0.0	3.25	---	DIP	16															
APR 14	18:01	0.0	3.25	---	DIP	19															
APR 16	18:00	0.0	2.89	---	DIP	21															
APR 17	18:00	0.0	2.49	---	DIP	19															
APR 18	10:30	0.5	2.21	17.0	DH59	18	254														
APR 19	18:00	5.0	4.42	17.0	DH59	40															
APR 20	18:00	9.0	3.49	17.0	DH59	38															
APR 21	18:00	14.0	2.85	17.0	DH59	27	278														
APR 23	18:00	14.0	2.48	17.0	DH59	29	291														
APR 24	18:00	12.0	2.03	17.0	DH59	26	360														
APR 25	18:00	8.0	2.01	17.0	DH59	55															
APR 26	18:00	6.0	2.63	17.0	DH59	20															
APR 27	18:00	4.0	2.17	17.0	DH59	19															
APR 28	18:00	5.0	1.85	17.0	DH59	17															
APR 29	18:00	4.0	1.59	17.0	DH59	18															
APR 30	18:00	5.0	1.55	17.0	DH59	19															
MAY 01	18:00E	0.0	1.51	17.0	DH59	19															
MAY 03	09:30	6.0	1.33	17.0	DH59	21	419														
MAY 05	18:00	8.0	1.09	17.0	DH59	12	483														
MAY 07	18:00	6.0	0.912	17.0	DH59	6															
MAY 09	18:00	4.0	1.17	17.0	DH59	9															
MAY 11	18:00	10.0	1.14	17.0	DH59	9															
MAY 13	18:00	14.0	0.891	17.0	DH59	10	474														
MAY 17	18:00	15.0	1.34	17.0	DH59	7															
MAY 19	18:00	11.0	1.96	17.0	DH59	8															
MAY 22	18:00	12.0	1.53	17.0	DH59	5															
MAY 23	18:00	15.0	1.51	17.0	DH59	5															
MAY 25	18:00	13.0	1.14	17.0	DH59	12															
MAY 27	18:00	10.0	1.04	17.0	DH59	16															
MAY 29	18:00	13.0	0.912	17.0	DH59	17	520														
MAY 31	18:00	9.0	0.906	17.0	DH59	19															
JUN 02	18:00	10.0	1.07	17.0	DH59	18															
JUN 04	18:00	12.0	1.75	17.0	DH59	17	512														
JUN 06	18:00	10.0	1.19	17.0	DH59	18															
JUN 08	18:00	15.0	1.17	17.0	DH59	13															
JUN 09	18:00	18.0	1.51	17.0	DH59	25															
JUN 11	18:05	19.0	1.64	17.0	DH59	13	495														
JUN 11	18:10	19.0	1.64	17.0	DH59	15															
JUN 11	22:00	17.0	1.57	17.0	DH59	16															
JUN 12	05:00	0.0	1.45	17.0	DH59	16															
JUN 13	18:00	20.0	1.13	17.0	DH59	17															
JUN 15	18:00	23.0	0.787	17.0	DH59	25															
JUN 17	18:00	24.0	0.482	17.0	DH59	12															
JUN 19	18:00	23.0	0.284	17.0	DH59	12	538														
JUN 21	18:00	23.0	1.71	17.0	DH59	11															
JUN 23	18:00	22.0	1.75	17.0	DH59	23															
JUN 25	18:00	23.0	1.18	17.0	DH59	13	566														
JUN 27	18:00	23.0	0.883	17.0	DH59	9															
JUL 01	18:00	23.0	1.04	17.0	DH59	30															
JUL 03	18:00	21.0	0.532	17.0	DH59	8	572														
JUL 04	15:45	20.0	0.436	17.0	DH59	8															
JUL 07	18:00	21.0	1.07	17.0	DH59	8															
JUL 10	18:00	19.0	0.781	17.0	DH59	8	467														
JUL 13	18:00	22.0	0.513	17.0	DH59	11															
JUL 16	18:00	20.0	0.382	17.0	DH59	13	465														
JUL 19	18:00	20.0	0.328	17.0	DH59	11															
JUL 22	18:00	18.0	0.338	17.0	DH59	35															
JUL 25	18:00	20.0	0.157	17.0	DH59	34															
JUL 28	18:00	19.0	0.264	17.0	DH59	55	425														
JUL 31	18:00	20.0	0.232	17.0	DH59	10															
AUG 03	18:00	20.0	0.220	17.0	DH59	13															
AUG 06	18:00	21.0	0.154	17.0	DH59	14	431														
AUG 09	18:00	21.0	0.042	17.0	DH59	11															
AUG 12	18:00	19.0	0.016	17.0	DH59	17															
AUG 15	18:00	17.0	0.034	17.0	DH59	7	422														
AUG 17	12:00	18.0	0.017	17.0	DH59	54															
AUG 20	18:00	19.0	0.027	17.0	DH59	43	434														
AUG 26	18:00	15.0	0.035	17.0	DH59	8	441														
AUG 29	18:00	18.0	0.031	17.0	DH59	54															
SEP 01	18:00	16.0	0.027	17.0	DH59	30	415														
SEP 04	18:00	15.0	0.036	17.0	DH59	23															
SEP 07	19:00	14.0	0.034	17.0	DH59	19															
SEP 11	18:00	16.0	0.043	17.0	DH59	44	422														
SEP 14	18:00	18.0	0.064	17.0	DH59	10															
SEP 17	18:00	14.0	0.056	17.0	DH59	22	425														
SEP 20	18:00	12.0	0.129	17.0	DH59	11															
SEP 23	18:00	8.0	0.278	17.0	DH59	6	701														
SEP 27	12:00	10.0	0.232	17.0	DH59	8															
OCT 01	18:00	6.0	0.272	17.0	DH59	9	590														
OCT 07	18:01	6.0	0.260	17.0	DH59	24															
OCT 10	18:00	4.0	0.277	17.0	DH59	12															
OCT 13	18:00	4.0	0.250	17.0	DH59	20															
OCT 16	18:00	4.0	0.112	17.0	DH59	49	398														
OCT 19	18:00	5.0	0.082	17.0	DH59	28															
OCT 22	18:00	3.0	0.131	17.0	DH59	8															
OCT 28	17:00	1.0	0.124	17.0	DH59	8	429														
NOV 01	10:30	3.0	0.054	17.0	DH59	34															
						8	430														

NOTE: SINGLE VERTICAL IS LOCATED AT 17.0 METRES FOR 1990

TIME SYMBOL: E - ESTIMATED
DISCHARGE SYMBOL(S): W - DAILY MEAN; ICE CONDITIONS

ICELANDIC RIVER NEAR RIVERTON - STATION NO. 05SC002

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1988	--CCCCCCCCP-	MANUAL	120 MAY 9	8 SEP 10	79.5APR 5	558	2.28	2.28	---
1989	--CCCCCCCC--	MANUAL	204 JUN 13 *	8 APR 2	536 JUN 13 *	1 450 *	5.92	4.10	44.4
1990	--CCCCCCCCP-	MANUAL	80 APR 7	2 MAY 17 *	112 APR 1	847	3.46	3.88	27.6

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MINK CREEK NEAR SIFTON - STATION NO. 05LJ048

LOCATION: LAT 51 25 55 N LONG 100 01 00 W
DRAINAGE AREA: 269 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1980	--CCCCCCCC--	MANUAL	203 APR 10 *	0 MAR 1 *	71.9APR 10 *	471 *	7.86	7.86	---
1981	--CCCCCCCC--	MANUAL	138 JUN 24	0 MAR 1	47.0JUN 24	135	2.54	5.20	51.1
1982	---PCPPP----	MANUAL	89 APR 15	2 JUL 20	20.6APR 15	83.4	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MOSSY RIVER BELOW OUTLET OF DAUPHIN LAKE - STATION NO. 05LJ025

LOCATION: LAT 51 27 00 N LONG 099 58 00 W
DRAINAGE AREA: 8 700 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1980	CCCCCCCCCCCC	MANUAL	58 DEC 1 *	4 APR 26	50.4DEC 4 *	2 370 *	---	---	---
1981	CCCCCCCCCCCC	MANUAL	29 OCT 2	5 NOV 9	17.1FEB 21	1 420	---	---	---
1982	CCCCCCCCCCCC	MANUAL	25 MAR 11	3 SEP 18 *	24.7APR 29	1 390	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

NELSON RIVER ABOVE BLADDER RAPIDS - STATION NO. 05UD00(

LOCATION: LAT 54 46 30 N LONG 097 55 50 W
DRAINAGE AREA: 997 000 km²
TYPE OF FLOW: REGULATED SINCE 1973
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1978	----P-PP----	MANUAL	24 JUL 18	14 AUG 23 *	--- ---	---	---	---	---
1984	--------P---	MANUAL	37 SEP 28 *	30 SEP 28	--- ---	---	---	---	---

MANUAL - MANUAL SAMPLING

P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

OCHRE RIVER AT OCHRE RIVER - STATION NO. 05LJ005

LOCATION: LAT 51 03 04 N LONG 099 47 15 W
DRAINAGE AREA: 342 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m³/s)	SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAY 17	14:35	5.0	34.4	13.0	DH59	1784	240	21	24	40	50	69	83	91	99	100			17	59	24
MAY 23	11:25	14.0	5.96	8.0	DH59	182	270														

NOTE: SINGLE VERTICAL IS UNDETERMINED FOR 1990

OCHRE RIVER AT OCHRE RIVER - STATION NO. 05LJ005

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1980	--CCCCCCCC--	MANUAL	1 130	APR 19	5	MAR 1	504	APR 19	3 690	---	---	---
1981	--CCCCCCCC--	MANUAL	557	JUN 12	5	MAR 1	480	JUN 18	4 200	---	---	---
1982	--CCCCCCCC--	MANUAL	961	APR 24	0	MAR 1 *	1 240	APR 23 *	8 750 *	---	---	---
1990	----P-------	MANUAL	1 780	MAY 17 *	182	MAY 23	---	---	---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

ODEI RIVER NEAR THOMPSON - STATION NO. 05TG003

LOCATION: LAT 55 59 45 N LONG 097 21 23 W
DRAINAGE AREA: 6 130 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAY-SEP MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1979	----P-PPC---		114	MAY 28	23	SEP 14	1 100	MAY 28	7 560	---	---	---
1980	----CCCCC---		169	AUG 26	32	JUL 18	1 870	AUG 26	44 900	293	293	---
1981	----CCCCC---		132	MAY 18	6	SEP 27 *	2 570	MAY 18	30 200	197	245	19.5
1982	----CCCCC---		144	MAY 2	33	SEP 1	4 230	MAY 3	78 400	512	334	27.9
1983	----CCCCP---		106	JUL 19	16	MAY 1	1 740	MAY 31	58 900	----	----	---
1984	----CCCCC---	MANUAL	71	JUN 10	17	AUG 27	544	MAY 6	26 700	175	294	26.2
1985	----CCCCCP--		206	JUN 25	21	SEP 5	3 860	MAY 1	99 100	647	365	25.3
1986	----CCCCC---		259	JUL 22 *	54	JUL 27	6 090	MAY 15 *	136 000 *	887	452	25.5
1987	---PCCCCC---		131	APR 30	22	SEP 30	2 310	APR 30	42 100	233	421	24.3

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

PACKHORSE CREEK NEAR MCCREARY - STATION NO. 05LJ034

LOCATION: LAT 50 43 00 N LONG 099 35 00 W
DRAINAGE AREA: 9.14 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1962	----PP------	MANUAL	7 630	MAY 30	200	MAY 28	---	---	---	---	---	---
1963	----PP------	MANUAL	5 680	JUN 10	520	MAY 26	---	---	---	---	---	---
1964	---PCCCCP--	MANUAL	605	MAY 4	4	MAY 23	31.4	MAY 4	61.3	---	---	---
1965	---CCCCCCC--	MANUAL	3 760	MAY 6	0	APR 1 *	373	MAY 6	1 350	6.60	6.60	---
1966	---CCCCCCC--	MANUAL	3 460	MAY 4	10	JUL 13	131	MAY 4	470	2.20	4.40	50.0
1967	---CCCCCCC--	MANUAL	1 070	MAY 7	0	APR 1	86.6	MAY 7	421	2.02	3.61	41.6
1968	---CCCCCCC--	MANUAL	2 230	MAY 7	6	JUL 17	107	MAY 8	298	1.39	3.05	39.2
1969	---CCCCCCC--	MANUAL	10 700	JUN 27	0	JUN 17	2 560	JUN 27	4 730 *	26.9	7.82	62.1
1970	---CCCCCCC--	MANUAL	6 000	MAY 17	3	JUL 18	533	MAY 7	2 320	10.8	8.32	48.0
1971	---PCCCCCP--	MANUAL	17 600	JUN 5 *	1	AUG 10	2 960	JUN 6 *	4 540	---	---	---
1972	----CCCCC---	MANUAL	1 380	MAY 12	1	JUL 9	26.6	MAY 12	157	---	---	---
1973	---CCCCCCC--	MANUAL	4 790	SEP 4	0	APR 1	196	JUN 20	517	2.64	7.51	46.2
1974	---CCCCCCC--	MANUAL	7 770	APR 25	0	APR 1	446	APR 26	1 570	8.25	7.60	39.6
1975	----CCC"P---	MANUAL	3 590	JUN 10	0	JUN 7	196	SEP 19	965	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

PEMBINA RIVER NEAR WINDYGATES - STATION NO. 05OB007

LOCATION: LAT 49 01 53 N LONG 098 16 40 W
DRAINAGE AREA: 7 510 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1962	---PCCCCCCCC	MANUAL	1 480	APR 20	6	JUN 29	5 590	APR 21	30 400	---	---	---
1963	CCCCCCCCCCCC	MANUAL	520	JUN 7	0	JAN 29 *	299	JUN 6	8 470	37.1	37.3	---
1964	CCCCCCCCCCCC	MANUAL	595	APR 21	0	JAN 21	378	APR 21	12 400	58.3	47.8	21.9
1965	CCCCCCCCCCCC	MANUAL	1 680	MAY 5	0	JAN 1	5 300	APR 14	57 600	280	125	62.0
1966	CCCCCCCCCCCC	MANUAL	2 330	MAR 31	8	NOV 30	6 470	APR 1	86 400	352	182	43.4
1967	CCCCCCCCCCCC	MANUAL	6 310	APR 20 *	0	OCT 1	13 800	APR 20	85 800	383	222	32.9
1968	CCCCCCCCCCCC	MANUAL	1 260	MAR 28	0	JAN 23	1 650	MAR 28	23 200	94.5	201	31.6
1969	CCCCCCCCCCCC	MANUAL	3 340	JUL 30	8	JAN 9	8 770	APR 19	144 000	587	256	30.0
1970	CCCCCCCCCCCC	MANUAL	5 080	APR 25	21	APR 3	16 800	APR 26	178 000	723	314	28.2
1971	CCCCCCCCCCCC	MANUAL	1 570	APR 10	20	OCT 19	17 500	APR 11	160 000	648	352	24.6
1972	CCCCCCCCCCCC	MANUAL	1 570	APR 11	17	OCT 15	6 040	APR 11	103 000	419	358	21.7
1973	CCCCCCCCCCCC	MANUAL	366	JUL 25	24	SEP 10	73.4	AUG 9	2 590	9.04	327	23.6
1974	CCCCCCCCCCCC	MANUAL	3 670	APR 16	24	AUG 16	28 300	MAY 21 *	393 000 *	1 600	433	29.5
1975	CCCCCCCCCCCC	MANUAL	1 100	MAY 1	10	FEB 25	3 480	MAY 12	90 600	369	428	27.4
1976	CCCCCCCCCCCC	MANUAL	3 240	APR 5	0	DEC 7	12 400	APR 6	289 000	1 180	481	25.2
1977	CCCCCCCCCCCC	MANUAL	2 680	MAY 19	0	JAN 1	1 274	MAY 22	1 460	7.12	450	26.0
1978	CCCCCCCCCCCC	MANUAL	2 800	APR 6	0	JAN 1	4 240	APR 9	41 500	191	434	25.5
1979	CCCCCCCCCCCC	MANUAL	2 440	APR 20	11	AUG 11	20 200	APR 22	352 000	1 440	493	24.3
1980	CCCCCCCCCCCC	MANUAL	1 290	MAY 29	0	DEC 26	385	MAY 29	3 330	13.4	466	24.9
1981	CCCCCCCCCCCC	MANUAL	3 740	MAY 21	0	JAN 1	1 530	MAY 21	4 370	17.7	442	25.3
1982	CCCCCCCCCCCC	MANUAL	4 660	JUN 7	0	JAN 1	12 600	JUN 7	53 200	231	432	24.7
1983	CCCCCCCCCCCC	MANUAL	1 610	APR 8	2	DEC 31	3 990	APR 8	46 400	189	420	24.1
1984	CCCCCCCCCCCC	MANUAL	993	JUN 16	0	JAN 2	739	JUN 16	1 760	8.71	402	24.7
1985	CCCCCCCCCCCC	MANUAL	1 730	MAR 22	0	JAN 1	2 920	MAR 23	44 800	194	393	24.3
1986	CCCCCCCCCCCC	MANUAL	1 630	MAR 22	5	DEC 26	2 720	MAR 20	48 300	197	384	23.8
1987	--CCCCCCCC-	MANUAL	2 340	APR 6	7	JUL 8	11 100	APR 6	118 000	482	388	22.6

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

PORTAGE DIVERSION NEAR OAKLAND - STATION NO. 05LL018

LOCATION: LAT 50 06 30 N LONG 098 22 50 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED SINCE 1970
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-MAY MEAN LOAD (TONNES)	SUMMARY : APR-MAY HISTORICAL MEAN LOAD (TONNES)	SUMMARY : APR-MAY STANDARD ERROR OF MEAN %
1970	---CC--------	MANUAL	2 340 APR 26	0 APR 1 *	38 300 APR 26	233 000	11 100	11 100	---
1971	---C---------	MANUAL	502 APR 20	0 APR 1	3 080 APR 20	12 300	---	---	---
1972	--CCC--------	MANUAL	1 990 APR 16	0 MAR 1	25 600 APR 16	147 000	4 090	7 600	46.2
1973	---C---------	MANUAL		0 APR 1	--- ---	---	---	---	---
1974	---CCCC------	MANUAL	2 390 APR 21	0 APR 1	82 000 APR 22	522 000	11 200	8 800	26.8
1975	---CCCC------	MANUAL	1 500 APR 24	0 APR 1	21 100 APR 24	258 000	5 910	8 080	22.5
1976	---CCC-------	MANUAL	3 420 APR 9 *	0 JUN 6	108 000 APR 9 *	1 500 000 *	24 700	11 400	31.6

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

PORTAGE DIVERSION NEAR PORTAGE LA PRAIRIE - STATION NO. 05LL019

LOCATION: LAT 49 58 00 N LONG 098 22 50 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED SINCE 1970
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-MAY MEAN LOAD (TONNES)	SUMMARY : APR-MAY HISTORICAL MEAN LOAD (TONNES)	SUMMARY : APR-MAY STANDARD ERROR OF MEAN %
1970	---CC--------	MANUAL	712 APR 28	0 APR 1 *	12 000 APR 28	94 200	4 490	4 490	---
1971	---C---------	MANUAL	618 APR 15	0 APR 1	1 590 APR 19	8 060	---	---	---
1972	--CCC--------	MANUAL	497 APR 16	0 MAR 1	9 790 APR 16	61 400	1 780	3 130	43.3
1973	---C---------	MANUAL		0 APR 1	--- ---	---	---	---	---
1974	---CCCC------	MANUAL	1 210 APR 21	0 APR 1	50 600 APR 22	296 000	6 310	4 190	31.4
1975	---CCCC------	MANUAL	1 140 APR 22	0 APR 1	20 700 MAY 1	247 000	5 640	4 550	21.9
1976	---CCC-------	MANUAL	1 660 APR 9 *	0 JUN 5	68 900 APR 22 *	916 000 *	15 000	6 640	33.6
1977	--CCCCCCCC---	MANUAL		0 MAR 1	--- ---	---	---	---	---
1979	--CCCCCCCC---	MANUAL	1 000 APR 21	0 MAR 1	19 800 APR 26	220 000	4 980	6 370	28.9

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

RAT RIVER BELOW NOTIGI CONTROL STRUCTURE - STATION NO. 05TF003

LOCATION: LAT 55 51 37 N LONG 099 17 34 W
DRAINAGE AREA: 6 080 km²
TYPE OF FLOW: REGULATED SINCE 1976
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1972	-----PP-P----	MANUAL	18 JUL 18	4 SEP 7 *	--- ---	---	---	---	---
1978	----PPPP-----	MANUAL	18 MAY 19 *	5 JUL 4	--- ---	---	---	---	---
1979	------P------	MANUAL	11 JUL 18	11 JUL 18	--- ---	---	---	---	---
1981	-----P-------	MANUAL	10 JUN 2	9 JUN 12	--- ---	---	---	---	---

MANUAL - MANUAL SAMPLING

P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER AT ELM PARK BRIDGE - STATION NO. 05OC003

LOCATION: LAT 49 51 15 N LONG 097 08 30 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED SINCE 1969
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1956	---PCP-------	MANUAL	1 910	APR 21 *	65	MAY 25	---	---	---	---	---	---
1957	---PCP-------	MANUAL	1 070	APR 29	25	MAY 24 *	---	---	---	---	---	---
1958	---P---------	MANUAL	460	APR 8	40	APR 12	---	---	---	---	---	---
1961	---P---------	MANUAL	250	APR 20	160	APR 26	---	---	---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MANITOBA

RED RIVER AT EMERSON - STATION NO. 05OC001

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 49 00 30 N LONG 097 12 40 W
DRAINAGE AREA: 102 000 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 202 000 TONNES FOR THE PERIOD MAR 01 TO NOV 19

REMARKS: BEG. 87, NOV, DEC, JAN & FEB SAMPLED ONLY ABOVE SPECIFIED FLOWS

	MAR			APR			MAY			
DAY	DAILY DISCHARGE (m³/s)	MEAN CON-CENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CON-CENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CON-CENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	7.43B	10	6.42	98.0 B	49 S	415	46.5	151	607	1
2	7.49B	10	6.47	111 B	114 S	1 090	46.7	144 S	581	2
3	7.55B	10	6.52	115 B	243 S	2 410	47.4	142	582	3
4	7.68B	10	6.64	128 B	262 S	2 900	48.5	145	608	4
5	7.83B	10	6.77	129 B	191	2 130	50.9	152	668	5
6	8.00B	10	6.91	134 B	142	1 640	52.5	162	735	6
7	8.17B	10	7.06	141 B	116 S	1 410	53.6	174	806	7
8	8.33B	10	7.20	148 B	110	1 410	53.8	189	879	8
9	8.67B	10	7.49	152 B	108 S	1 420	53.6	196	908	9
10	9.11B	10	7.87	155 B	109	1 460	52.9	200 S	914	10
11	9.29B	11	8.83	151 B	121 S	1 580	51.9	202	906	11
12	10.2 B	13	11.5	147 B	138	1 750	50.5	205	894	12
13	12.4 B	17	18.2	146 B	148 S	1 870	49.5	206	881	13
14	12.9 B	22	24.5	141 B	165 S	2 010	48.2	207	862	14
15	14.7 B	27	34.3	131 B	220 S	2 490	47.0	206 S	837	15
16	19.1 B	32	52.8	122 B	300	3 160	45.9	197	781	16
17	20.8 B	37	66.5	105 B	332	3 010	43.8	185	700	17
18	28.2 B	43	105	92.1 B	322	2 560	43.1	172	641	18
19	37.7 B	51 S	166	80.6	291 S	2 030	42.5	165	606	19
20	50.8 B	60	263	68.6	253	1 500	42.0	164	595	20
21	65.4 B	70	396	61.9	225	1 200	42.3	165 S	603	21
22	75.8 B	77	504	57.3	207	1 020	42.9	170	630	22
23	77.2 B	78	520	53.7	200 S	928	44.3	193	739	23
24	73.1 B	71	448	50.9	202	888	45.6	222	875	24
25	67.4 B	60	349	49.0	210 S	889	46.1	251	1 000	25
26	61.2 B	47	249	47.1	205	834	46.1	263	1 050	26
27	56.6 B	39	191	45.7	191	754	46.0	264	1 050	27
28	53.8 B	37	172	45.8	176 S	696	45.4	264	1 040	28
29	52.8 B	39	178	46.4	164	657	44.5	264 S	1 020	29
30	56.6 B	44	215	46.6	156	628	43.3	261	976	30
31	70.9 B	46 S	282				42.0	259	940	31
TOTAL	1 007.35		4 324	2 999.6		46 739	1 459.3		24 914	

	JUN			JUL			AUG			
DAY	DAILY DISCHARGE (m³/s)	MEAN CON-CENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CON-CENTRATION (mg/L)	DAILY LOAD (t)	DAILY DISCHARGE (m³/s)	MEAN CON-CENTRATION (mg/L)	DAILY LOAD (t)	DAY
1	40.8	257	906	61.1	345	1 820	20.6	122	217	1
2	41.6	257	924	57.4	314	1 560	20.5	119	211	2
3	41.9	256	927	55.5	281	1 350	19.0	117	192	3
4	42.1	259	942	52.0	243	1 090	17.5	114	172	4
5	45.4	281	1 100	49.4	209	892	16.0	110	152	5
6	55.6	321	1 540	47.7	187 S	771	14.8	106	136	6
7	69.7	407 S	2 450	46.3	175	700	13.8	107	128	7
8	80.5	706	4 910	43.7	164	619	12.8	116	128	8
9	83.6	1 110	8 020	42.9	155	575	12.4	131	140	9
10	81.7	1 230	8 680	42.4	150	550	11.9	142	146	10
11	76.6	1 180	7 810	41.1	143	508	11.6	157	157	11
12	70.7	1 110	6 780	38.6	137	457	11.6	165	165	12
13	65.7	1 050	5 960	35.6	130	400	11.7	167	169	13
14	62.4	1 040 S	5 610	32.5	124	348	11.7	165 S	167	14
15	63.6	1 040	5 710	30.2	123 S	321	11.0	162	154	15
16	63.2	906	4 950	28.6	123	304	10.3	158	141	16
17	61.9	720	3 850	27.7	123	294	10.7	158	146	17
18	60.6	537 S	2 810	27.0	126 S	294	10.5	158	143	18
19	59.2	427	2 180	26.7	124	286	11.0	171	163	19
20	57.0	384	1 890	26.5	120	275	12.6	179 S	195	20
21	55.5	362 S	1 740	24.9	108	232	13.3	181	208	21
22	56.9	354	1 740	23.5	101 S	205	13.1	179	203	22
23	56.2	348	1 690	21.9	101	191	12.9	177	197	23
24	55.8	353	1 700	20.7	103	184	12.8	175	194	24
25	59.7	383	1 980	19.9	107	184	12.6	179	195	25
26	66.5	404	2 320	19.5	115 S	194	12.8	180	199	26
27	70.9	412	2 520	19.6	118	200	12.8	178 S	197	27
28	71.4	404	2 490	20.1	122	212	12.2	170	179	28
29	68.8	392	2 330	20.7	125	224	11.5	162	161	29
30	65.1	373	2 100	21.1	130	237	11.1	148	142	30
31				21.2	129	236	10.9	136	128	31
TOTAL	1 850.6		98 559	1 046		15 713	408		5 225	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

RED RIVER AT EMERSON - STATION NO. 05OC001

SUSPENDED SEDIMENT FOR 1990

DAY	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)	SEP DAILY LOAD (t)	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	NOV DAILY DISCHARGE (m^3/s)	NOV MEAN CONCENTRATION (mg/L)	NOV DAILY LOAD (t)	DAY
1	10.6	138 S	126	8.87	122	93.5	8.53	36	26.5	1
2	10.6	149	136	8.63	119	88.7	8.41	35	25.4	2
3	11.2	173	167	8.56	109	80.6	8.30	34	24.4	3
4	12.1	188	197	8.49	101	74.1	8.48B	34	24.9	4
5	12.0	190	197	8.44	100	72.9	8.81B	34	25.9	5
6	12.2	187	197	8.88	100	76.7	9.02B	34	26.5	6
7	12.3	179	190	8.98	100	77.6	8.85B	34	26.0	7
8	11.9	168	173	9.05	100	78.2	8.47B	34 S	24.9	8
9	11.8	167	170	9.17	100	79.4	8.72B	33	24.9	9
10	11.4	166	164	9.01	99	77.1	8.68B	33	24.7	10
11	11.2	165	160	8.92	99	76.3	8.52B	31	22.8	11
12	11.1	163	156	8.62	97	72.2	8.55B	31	22.9	12
13	10.4	160	144	8.16	94	66.3	8.59B	31	23.0	13
14	9.97	155	134	8.19	92	65.1	8.86B	30 S	23.0	14
15	9.79	154	130	8.08	90	62.8	9.22B	30	23.9	15
16	9.83	154	131	8.03	90	62.4	9.08B	30	23.5	16
17	9.63	156 S	130	8.13	87	61.1	9.15B	29	22.9	17
18	9.96	149	128	7.79	86 S	57.9	9.01B	29	22.6	18
19	9.28	133	107	7.69	85	56.5	9.21B	29 S	23.1	19
20	8.30	114	81.8	8.10	83	58.1	9.90B			20
21	8.04	100	69.5	8.15	82 S	57.7	11.0 B			21
22	7.93	99	67.8	8.17	77	54.3	10.6 B			22
23	8.00	100	69.1	6.43	67	40.8	9.12B			23
24	8.99	106	82.3	8.21	58	41.1	7.39B			24
25	10.0	123	106	8.19	51	36.1	8.26B			25
26	10.6	146	134	8.67	48 S	36.0	9.21B			26
27	11.2	171 S	165	8.79	47	35.7	9.63B			27
28	11.0	161	153	8.21	45	31.9	9.26B			28
29	10.2	145	128	8.40	44	31.9	8.37B			29
30	9.31	133	107	8.73	42	31.7	8.07B			30
31				8.41	39	28.3				31
TOTAL	310.83		4 101	262.15		1 871	267.27		462	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

RED RIVER AT EMERSON - STATION NO. 05OC001

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)		SINGLE SAMPLING VERTICAL (m)		TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAR 19	13:30	0.5	37.7	W	30.0	X	DH48	51	560														
MAR 31	13:30	4.0	70.9	W	WELB	X	DIP	46															
APR 01	13:30	4.0	98.0	W	WELB	X	DIP	45															
APR 02	18:00	2.0	111	W	132		DH59	137															
APR 03	18:00	2.0	115	W	132		DH59	288	269														
APR 04	10:20	1.0	128	W	132		DH59	266	267														
APR 07	15:00	1.0	141	W	132		DH59	112															
APR 09	12:05	1.0	152	W	132		DH59	109	389														
APR 11	15:00	1.0	151	W	132		DH59	123															
APR 13	15:00	1.0	146	W	132		DH59	150	334														
APR 14	20:00	1.0	141	W	132		DH59	172	343	40	59	80	89	92	96	98	99	100		4	37	59
APR 15	18:00	1.5	131	W	132		DH59	240															
APR 19	17:00	9.5	76.9		132		DH59	283	436	35	60	85	89	94	95	98	99	100		5	35	60
APR 21	17:00	17.0	53.0		132		DH59	197	444														
APR 23	17:00	17.0	48.5		132		DH59	209															
APR 25	17:00	18.0	46.0		132		DH59	172	486														
APR 28	17:00	10.0	46.7		132		DH59	143															
MAY 02	17:00	12.0	52.9		132		DH59	200	524														
MAY 10	13:10	18.0	47.0		132		DH59	207															
MAY 15	13:10	18.0	42.3		132		DH59	165															
MAY 21	13:10	20.0	44.5		132		DH59	264	494														
MAY 29	13:48	23.0	71.8		132		DH59	419	455	36	52	75	90	92	98	99	100			2	46	52
JUN 07	16:00	20.0	62.0		132		DH59	1046	459	12	30	88	98	98	98	99	100			2	68	30
JUN 14	16:00	23.0	60.2		132		DH59	501															
JUN 18	16:00	20.5	55.2		132		DH59	367	521														
JUN 21	09:05	23.0	47.6		132		DH59	188															
JUL 06	09:05	25.0	30.3		132		DH59	123															
JUL 15	09:05	26.0	23.7		132		DH59	127	576														
JUL 18	09:05	25.0	26.9		132		DH59	101	616														
JUL 22	09:05	25.0	21.7		132		DH59	116	590														
JUL 26	08:40	24.0	19.5		132		DH59	165	492														
AUG 14	18:00	24.0	11.7		132		DH59	181	498														
AUG 20	18:00	24.0	12.8		132		DH59	180	448														
AUG 27	09:30	24.0	13.0		132		DH59	140															
SEP 01	18:00	26.0	10.6		132		DH59	156	560														
SEP 11	18:00	18.0	9.52		132		DH59	177	651														
SEP 27	13:15	15.0	11.3		132		DH59	86	677														
OCT 18	13:15	10.0	7.75		132		DH59	82															
OCT 21	13:15	8.0	8.14		132		DH59	48	706														
OCT 26	09:00	5.0	8.67		132		DH59	34	614														
NOV 08	15:00	5.0	8.47	W	132		DH59	30	614														
NOV 14	15:00	5.0	8.86	W	132		DH59	29	548														
NOV 19	15:00	7.0	9.21	W	132		DH59	29	548														

NOTE: SINGLE VERTICAL IS LOCATED AT 132 METRES FOR 1990

DISCHARGE SYMBOL(S): W - DAILY MEAN; ICE CONDITIONS
VERTICAL SYMBOL(S): X - NOT AT REGULAR SINGLE SAMPLE VERTICAL

RED RIVER AT EMERSON - STATION NO. 05OC001

HISTORICAL SEDIMENT DATA SUMMARY

SUMMARY : MAR-OCT

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1956	---PC-------	MANUAL	665	APR 21	250	MAY 5	39 300	APR 23	666 000	---	---	---
1961	---P--------	MANUAL	390	APR 18	130	APR 25	---	---	---	---	---	---
1978	CCCCCCCCCCCC	MANUAL	733	JUL 17	17	DEC 2	55 100	APR 11 *	1 130 000	4 580	4 580	---
1979	CCCCCCCCCCC	MANUAL	536	JUL 7	11	FEB 13	48 800	APR 26	1 500 000 *	6 100	5 340	14.2
1980	CCCCCCCCCCCC	MANUAL	674	APR 8	9	FEB 13	33 400	APR 9	369 000	1 480	4 050	33.5
1981	CCCCCCCCCCCC	MANUAL	1 730	MAY 30	9	JAN 14	22 000	JUL 3	373 000	1 450	3 400	34.1
1982	CCCCCCCCCCCC	MANUAL	1 620	JUN 9	8	JAN 6	33 200	APR 17	846 000	3 390	3 400	26.4
1983	CCCCCCCCCCCC	MANUAL	666	JUN 18	6	FEB 7 *	33 200	APR 9	762 000	3 020	3 340	22.1
1984	CCCCCCCCCCCC	MANUAL	853	JUN 11	10	JAN 5	32 700	JUN 13	732 000	2 940	3 280	19.0
1985	CCCCCCCCCCCC	MANUAL	1 930	MAY 17 *	8	MAR 5	54 000	MAY 17	1 210 000	4 900	3 480	16.6
1986	CCCCCCCCCCC	MANUAL	729	OCT 2	9	FEB 19	45 900	MAR 31	1 050 000	4 230	3 560	14.5
1987	--CCCCCCCP-	MANUAL	1 890	JUL 26	6	MAR 7	38 500	JUL 27	818 000	3 330	3 540	13.1
1988	--CCCCCCCP-	MANUAL	918	APR 8	10	MAR 1	33 800	APR 8	287 000	1 170	3 330	14.1
1989	--CCCCCCCP-	MANUAL	569	APR 18	8	MAR 29	42 500	APR 19	580 000	2 370	3 250	13.5
1990	--CCCCCCCP-	MANUAL	1 230	JUN 10	10	MAR 1	8 680	JUN 10	202 000	822	3 060	14.5

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER AT SELKIRK - STATION NO. 05OJ005

LOCATION: LAT 50 08 30 N LONG 096 52 05 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1956	---PC-------	MANUAL	1 030	APR 23	220	MAY 19	---	---	---	---	---	---
1957	---PPP------	MANUAL	1 470	MAY 2 *	50	MAY 25	---	---	---	---	---	---
1958	---P--------	MANUAL	760	APR 7	44	APR 30 *	---	---	---	---	---	---
1961	---P--------	MANUAL	225	APR 19	80	APR 26	---	---	---	---	---	---
1974	---PPP------	MANUAL	897	APR 23	158	JUN 4	---	---	---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER AT WINNIPEG - STATION NO. 05OJ001

LOCATION: LAT 49 55 00 N LONG 097 07 30 W
DRAINAGE AREA: 277 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1956	---PCP------	MANUAL	845	APR 24	100	MAY 26	---	---	---	---	---	---
1957	---PCP------	MANUAL	1 070	APR 29	45	APR 10 *	---	---	---	---	---	---
1958	---PP-------	MANUAL	1 180	APR 10 *	120	APR 24	---	---	---	---	---	---
1959	---P--------	MANUAL	605	APR 15	115	APR 30	---	---	---	---	---	---
1961	---P--------	MANUAL	345	APR 19	145	APR 25	---	---	---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER FLOODWAY NEAR LOCKPORT - STATION NO. 05OJ014

LOCATION: LAT 50 05 00 N LONG 096 55 40 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED SINCE 1969
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-MAY MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1969	---CC-------	MANUAL	3 160	APR 17 *	0	APR 1 *	73 200	APR 17	802 000	22 900	22 900	---
1970	---CC-------	MANUAL	1 590	APR 19	0	APR 1	50 900	APR 27	447 000	22 300	22 600	1.3
1971	---C--------	MANUAL	2 710	APR 13	0	APR 1	54 100	APR 13	230 000	---	---	---
1972	---C--------	MANUAL	532	APR 18	0	APR 1	2 990	APR 18	11 600	---	---	---
1973	---C--------	MANUAL			0	APR 1	---	---	---	---	---	---
1974	---CCP------	MANUAL	1 730	APR 19	0	APR 1	85 800	APR 24 *	923 000 *	21 500	22 200	1.9
1975	---CC-------		457	MAY 2	0	APR 1	8 150	MAY 5	74 400	3 720	17 600	26.3
1976	---C--------		1 080	APR 9	0	APR 1	21 000	APR 9	103 000	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER FLOODWAY NEAR ST. NORBERT - STATION NO. 05OC017

LOCATION: LAT 49 45 24 N LONG 097 07 36 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED SINCE 1969
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-MAY MEAN LOAD (TONNES)	SUMMARY : APR-MAY HISTORICAL MEAN LOAD (TONNES)	SUMMARY : APR-MAY STANDARD ERROR OF MEAN %
1969	---CC--------	MANUAL	3 440 APR 14 *	0 APR 1 *	23 700 APR 17	324 000	9 270	9 270	---
1970	---CC--------	MANUAL	1 230 APR 19	0 APR 1	27 000 APR 27	310 000	8 850	9 060	2.3
1971	---C---------	MANUAL	2 870 APR 12	0 APR 1	42 200 APR 13	166 000	---	---	---
1972	---C---------	MANUAL	586 APR 19	0 APR 1	1 530 APR 18	5 350	---	---	---
1973	---C---------	MANUAL		0 APR 1	--- ---	---	---	---	---
1974	---CCP-------	MANUAL	1 500 APR 19	0 APR 1	54 200 APR 23 *	664 000	16 200	11 400	20.8
1975	---CC--------	MANUAL	420 APR 30	0 APR 1	4 870 MAY 4	52 200	2 610	9 230	30.1
1976	---C---------	MANUAL	745 APR 8	0 APR 1	13 100 APR 10	80 000	---	---	---
1977	--CCCCCCCC--	MANUAL		0 MAR 1	--- ---	---	---	---	---
1978	--CCCCCCCC--	MANUAL	990 APR 15	0 MAR 1	33 100 APR 16	275 000	11 000	9 580	22.7
1979	--CCCCCCCC--	MANUAL	981 APR 20	0 MAR 1	43 200 APR 23	697 000 *	17 000	10 800	20.0

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MANITOBA

RED RIVER NEAR LOCKPORT - STATION NO. 05OJ010

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 50 06 28 N LONG 096 55 54 W
DRAINAGE AREA: 278 000 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 479 000 TONNES FOR THE PERIOD MAR 01 TO NOV 30

REMARKS: BEG. 1987, NOV, DEC, JAN & FEB SAMPLED ONLY ABOVE SPECIFIED FLOWS

DAY	MAR DAILY DISCHARGE (m³/s)	MAR MEAN CONCENTRATION (mg/L)	MAR DAILY LOAD (t)	APR DAILY DISCHARGE (m³/s)	APR MEAN CONCENTRATION (mg/L)	APR DAILY LOAD (t)	MAY DAILY DISCHARGE (m³/s)	MAY MEAN CONCENTRATION (mg/L)	MAY DAILY LOAD (t)	DAY
1	21.7 B	10	18.7	141 B	95	1 160	87.5	46 S	348	1
2	21.7 B	10	18.7	188 B	98	1 590	87.9	28 S	213	2
3	21.4 B	10	18.5	270 B	99	2 310	98.3	102 S	778	3
4	21.2 B	10	18.3	334 B	123 S	3 550	114	109 S	1 070	4
5	22.4 B	10	19.4	367 B	133 S	4 220	166	115 S	1 650	5
6	22.8 B	8	15.8	372 B	159 S	5 110	159	80 S	1 100	6
7	22.8 B	8	15.8	371 B	160 S	5 130	156	78 S	1 050	7
8	23.0 B	8	15.9	375 B	184 S	5 960	147	39 S	495	8
9	23.4 B	8	16.2	378 B	569 S	18 600	137	25 S	296	9
10	23.6 B	10	20.4	377 B	794 S	25 900	130	20 S	225	10
11	23.9 B	11	22.7	367 B	380 S	12 000	127	18 S	198	11
12	24.5 B	12	25.4	364 B	620 S	19 500	120	19 S	197	12
13	25.3 B	11	24.0	362	858 S	26 800	121	23 S	240	13
14	26.5 B	13	29.9	360	1 260 S	39 200	118	97 S	989	14
15	29.1 B	14	35.2	362	327 S	10 200	114	120 S	1 180	15
16	38.9 B	16	53.8	366	392 S	12 400	106	119 S	1 090	16
17	52.6 B	16	72.7	368	581 S	18 500	107	129 S	1 190	17
18	56.4 B	18	87.7	365	544 S	17 200	109	142 S	1 150	18
19	54.7 B	20	94.5	362	317	9 910	111	97 S	930	19
20	56.0 B	23	111	359	832 S	25 800	113	64 S	625	20
21	64.8 B	27	151	325	1 300 S	36 500	114	48 S	473	21
22	81.6 B	30	212	265	1 960 S	44 900	113	22 S	215	22
23	94.2 B	34	277	230	1 650 S	32 800	111	75 S	719	23
24	103 B	39	347	195	321 S	5 410	108	89 S	830	24
25	115 B	41	407	165	126 S	1 800	106	126 S	1 150	25
26	120 B	43	446	115	65 S	646	105	199 S	1 810	26
27	120 B	45	467	78.1	87 S	587	99.3	91 S	781	27
28	113 B	49 S	478	79.2	119 S	814	99.9	29 S	250	28
29	106 B	57	522	82.0	95 S	673	101	35 S	305	29
30	104 B	67	602	85.0	56 S	411	104	35 S	314	30
31	106 B	87	797				104	41 S	368	31
TOTAL	1 739.5		5 441	8 427.3		389 581	3 583.9		22 229	

DAY	JUN DAILY DISCHARGE (m³/s)	JUN MEAN CONCENTRATION (mg/L)	JUN DAILY LOAD (t)	JUL DAILY DISCHARGE (m³/s)	JUL MEAN CONCENTRATION (mg/L)	JUL DAILY LOAD (t)	AUG DAILY DISCHARGE (m³/s)	AUG MEAN CONCENTRATION (mg/L)	AUG DAILY LOAD (t)	DAY
1	103	44 S	392	110	66 S	627	50.8	143	628	1
2	110	56 S	532	104	99 S	890	48.0	160 S	664	2
3	125	58 S	626	103	102	908	46.5	179	719	3
4	136	62 S	729	102	96	846	46.6	192	773	4
5	134	46 S	533	102	97	855	45.9	198 S	785	5
6	134	65 S	753	102	83	731	44.4	181	694	6
7	140	70 S	847	99.0	77	659	42.0	89	323	7
8	170	67 S	984	98.4	67	570	38.8	42 S	141	8
9	185	83 S	1 330	98.3	56 S	476	37.9	35	115	9
10	192	98 S	1 630	98.3	55	467	36.6	33	104	10
11	191	89	1 470	98.2	56	475	36.6	31 S	98.0	11
12	192	64 S	1 060	100	55	475	34.6	31	92.7	12
13	196	47 S	796	99.9	55	475	33.9	27 S	79.1	13
14	195	13 S	556	95.8	57	472	31.4	26	70.5	14
15	183	60 S	949	90.7	57	447	33.4	21 S	60.6	15
16	158	62 S	846	87.0	56 S	421	32.7	21	59.3	16
17	146	47 S	593	83.7	58	419	33.9	23	71.3	17
18	133	63 S	724	81.7	60	424	37.3	22 S	70.9	18
19	126	73 S	795	78.9	63	429	33.4	24	69.3	19
20	121	107 S	1 120	76.3	66	435	30.2	27	70.5	20
21	120	232 S	2 410	73.8	66	421	28.7	38 S	94.2	21
22	124	225 S	2 410	71.2	67	412	27.7	41	98.1	22
23	127	89 S	977	68.1	67	394	28.1	38	92.3	23
24	123	65 S	691	64.9	74	415	37.5	34 S	110	24
25	120	67 S	695	61.1	75 S	396	38.9	67	225	25
26	117	67 S	677	57.5	78	388	38.8	94	315	26
27	117	64 S	647	54.5	93	438	37.5	70 S	227	27
28	120	73 S	757	52.6	106 S	482	35.2	57 S	173	28
29	149	87 S	902	51.0	114	502	31.5	49	133	29
30	117	66 S	667	51.9	119	534	28.6	48	119	30
31				52.1	131 S	590	24.4	51	108	31
TOTAL	4 275		28 098	2 567.9		16 473	1 133.8		7 383	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

RED RIVER NEAR LOCKPORT - STATION NO. 05OJ010

SUSPENDED SEDIMENT FOR 1990

DAY	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)	SEP DAILY LOAD (t)	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	NOV DAILY DISCHARGE (m^3/s)	NOV MEAN CONCENTRATION (mg/L)	NOV DAILY LOAD (t)	DAY
1	23.0	170 S	338	39.0	109	367	53.2	40 S	184	1
2	23.6	150	306	34.1	78 S	230	52.2	52 S	235	2
3	22.1	62 S	118	26.5	60	137	51.7	48 S	214	3
4	21.5	33	61.3	20.0	53	91.6	51.0	26 S	115	4
5	23.0	20	39.7	21.0	95 S	172	50.4	19 S	82.7	5
6	22.7	12 S	23.5	23.2	115	231	47.0	15 S	60.9	6
7	26.8	48	111	23.2	113	227	42.6	8 S	29.4	7
8	24.9	65	140	21.0	111 S	201	35.0	8 S	24.2	8
9	25.7	59 S	131	20.1	66	115	27.4	13 S	30.8	9
10	24.6	59	125	19.9	34	58.5	29.5	7 S	17.8	10
11	21.9	64	121	18.8	29 S	47.1	30.3	10 S	26.2	11
12	22.0	60 S	114	20.5	29	51.4	27.5	11 S	26.1	12
13	22.0	68	129	19.6	21 S	35.6	29.6	29 S	74.2	13
14	21.1	75	137	21.0	18	32.7	26.4	65 S	148	14
15	19.9	76 S	131	29.2	22	55.5	27.5	18 S	42.8	15
16	21.8	82	154	48.0	23 S	95.4	27.7	18	43.1	16
17	19.1	86	142	49.3	17 S	72.4	28.9	18	44.9	17
18	17.5	81 S	122	50.0	25 S	108	29.2	19	47.9	18
19	21.2	59	108	48.7	25 S	105	29.3	19	48.1	19
20	25.5	42	92.5	48.5	23 S	96.4	30.0	19	49.2	20
21	28.7	45 S	112	46.9	25 S	101	28.6	20	49.4	21
22	27.4	117	277	46.4	21 S	84.2	50.8	20	87.8	22
23	24.8	95	204	46.4	18 S	72.2	65.3	20	113	23
24	19.8	64	109	45.2	15 S	58.6	50.4	21	91.4	24
25	23.0	34	67.6	45.1	13 S	50.7	35.4	20	61.2	25
26	28.3	29 S	70.9	44.6	11 S	42.4	28.9 B	19	47.4	26
27	32.5	54	150	44.4	11 S	42.2	26.0 B	19	42.7	27
28	35.5	78	239	44.5	11 S	42.3	23.3 B	20	40.3	28
29	39.8	115 S	395	46.0	15 S	59.6	19.7 B	20	34.0	29
30	42.0	142	515	48.4	34 S	142	18.5 B	20	32.0	30
31				49.8	16 S	68.8				31
TOTAL	751.4		4 784	1 109.3		3 294	1 073.3		2 144	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

RED RIVER NEAR LOCKPORT - STATION NO. 05OJ010

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)		SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)		DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAR 28	13:20	0.5	113	W	95.0	DH48	48		487														
APR 04	17:30	1.0	334	W	98.0	DH59	114		303														
APR 04	17:55	1.0	334	W	150	DH59	161		273														
APR 04	18:05	1.0	334	W	125	DH59	184		272														
APR 04	18:15	1.0	334	W	99.0	DH59	190		283														
APR 04	18:25	1.0	334	W	75.0	DH59	203		277														
APR 04	18:30	1.0	334	W	50.0	DH59	148		286														
APR 05	12:45	1.0	367	W	95.0	DH59	1077																
APR 06	11:05	2.0	372	W	95.0	DH59	169	G															
APR 06	11:17	2.0	372	W	95.0	DH59	156																
APR 07	13:15	1.0	371	W	95.0	DH59	156		258														
APR 08	15:15	1.0	375	W	95.0	DH59	165																
APR 09	10:55	1.0	378	W	95.0	DH59	529																
APR 09	13:05	3.0	378	W	95.0	DH59	196																
APR 09	15:00	1.0	378	W	95.0	DH59	534																
APR 10	09:15	2.0	377	W	95.0	DH59	862		338														
APR 10	14:50	2.0	377	W	95.0	DH59	808		354	28	34	54	82	98	99	100				1	65	34
APR 11	09:45	2.0	367	W	95.0	DH59	354																
APR 11	15:05	2.0	367	W	95.0	DH59	349																
APR 12	10:20	2.0	364	W	95.0	DH59	623																
APR 12	16:15	2.0	364	W	95.0	DH59	725																
APR 13	14:10	4.0	362	H	95.0	DH59	1030		337	15	29	45	63	86	100					0	71	29
APR 13	17:20	5.0	362	H	95.0	DH59	741		334														
APR 14	12:05	5.0	360	H	95.0	DH59	2163																
APR 14	18:15	5.0	360	H	95.0	DH59	1173																
APR 14	18:45	5.0	360	H	95.0	DH59	356																
APR 15	10:05	5.0	362	H	95.0	DH59	367																
APR 15	14:05	5.0	362	H	95.0	DH59	357																
APR 16	11:00	5.0	366	H	95.0	DH59	324																
APR 16	14:55	5.0	366	H	95.0	DH59	445																
APR 17	10:00	10.0	368	H	95.0	DH59	215																
APR 17	11:40	10.0	368	H	95.0	DH59	867		333	15	27	45	65	91	99	99	100			1	72	27
APR 17	15:25	10.0	368	H	95.0	DH59	855																
APR 18	08:45	10.0	365	H	95.0	DH59	588																
APR 18	14:45	11.0	365	H	95.0	DH59	503																
APR 20	09:15	7.0	359	H	95.0	DH59	667																
APR 20	12:15	8.0	359	H	95.0	DH59	1214																
APR 20	19:30	8.0	359	H	95.0	DH59	1124																
APR 21	08:30	10.0	325	H	95.0	DH59	1221																
APR 21	15:15	10.0	325	H	95.0	DH59	1348		357	11	17	29	42	66	91	97	100			9	74	17
APR 22	10:40	10.0	265	H	95.0	DH59	1931		383														
APR 23	07:05	10.0	230	H	95.0	DH59	2067		392														
APR 23	19:50	10.0	230	H	95.0	DH59	1082																
APR 24	08:05	16.0	195	H	95.0	DH59	243																
APR 24	15:00	16.0	195	H	95.0	DH59	295																
APR 25	09:30	13.0	165	H	95.0	DH59	108																
APR 25	18:10	13.0	165	H	95.0	DH59	108																
APR 26	09:10	12.0	115	H	95.0	DH59	51																
APR 26	19:00	12.0	115	H	95.0	DH59	68																
APR 27	12:45	9.0	78.1	H	95.0	DH59	99																
APR 27	15:15	8.0	78.1	H	95.0	DH59	70																
APR 27	18:05	8.0	78.1	H	95.0	DH59	72																
APR 28	08:00	8.0	79.2	H	95.0	DH59	68																
APR 28	17:15	7.0	79.2	H	95.0	DH59	173																
APR 29	09:15	8.0	82.0	H	95.0	DH59	82		462														
APR 29	15:15	8.0	82.0	H	95.0	DH59	84																
APR 30	11:20	8.0	85.0	H	95.0	DH59	37																
APR 30	18:10	7.0	85.0	H	95.0	DH59	49																
MAY 01	10:20	7.0	87.5	H	95.0	DH59	46																
MAY 01	15:15	7.0	87.5	H	95.0	DH59	35																
MAY 02	10:10	8.0	87.9	H	95.0	DH59	27																
MAY 02	19:25	10.0	87.9	H	95.0	DH59	29		467														
MAY 03	11:15	12.0	88.3	H	95.0	DH59	112																
MAY 03	18:10	12.0	88.3	H	95.0	DH59	119																
MAY 04	08:15	12.0	114	H	95.0	DH59	116																
MAY 04	16:05	13.0	114	H	95.0	DH59	100																
MAY 05	10:25	13.0	166	H	95.0	DH59	139																
MAY 05	16:15	13.0	166	H	95.0	DH59	109																
MAY 06	11:15	13.0	159	H	95.0	DH59	77																
MAY 06	16:05	13.0	159	H	95.0	DH59	80																
MAY 07	15:30	13.0	156	H	95.0	DH59	79		460														
MAY 08	11:45	13.0	147	H	95.0	DH59	38		462														
MAY 09	09:15	13.0	137	H	95.0	DH59	23																
MAY 09	09:35	13.0	137	H	95.0	DH59	29																
MAY 10	19:00	14.0	130	H	95.0	DH59	19																
MAY 11	13:16	14.0	127	H	95.0	DH59	18																
MAY 12	15:15	14.0	120	H	95.0	DH59	18																
MAY 13	12:45	14.0	121	H	95.0	DH59	13																
MAY 14	15:05	16.0	118	H	95.0	DH59	106																
MAY 15	18:30	16.0	114	H	95.0	DH59	123		488														
MAY 16	14:20	16.0	106	H	95.0	DH59	117																
MAY 17	19:00	17.0	107	H	95.0	DH59	136		497														
MAY 18	16:20	17.0	109	H	95.0	DH59	117																
MAY 19	08:15	17.0	111	H	95.0	DH59	103																
MAY 20	18:15	15.0	113	H	95.0	DH59	55																
MAY 21	08:05	15.0	114	H	95.0	DH59	53																
MAY 22	19:30	14.0	113	H	95.0	DH59	13																
MAY 23	17:30	15.0	111	H	95.0	DH59	111		514														
MAY 24	10:15	15.0	108	H	95.0	DH59	34																
MAY 24	10:25	15.0	108	H	95.0	DH59	36																
MAY 24	16:10	15.0	108	H	95.0	DH59	102																
MAY 24	18:10	15.0	108	H	95.0	DH59	144																
MAY 25	18:30	15.0	106	H	95.0	DH59	117																
MAY 26	12:30	15.0	105	H	95.0	DH59	224																
MAY 27	10:10	17.0	99.3	H	95.0	DH59	39																
MAY 28	21:30	17.0	99.9	H	95.0	DH59	39		497														
MAY 29	15:15	17.0	101	H	95.0	DH59	34																
MAY 30	17:25	17.0	104	H	95.0	DH59	38																
MAY 31	21:00	17.0	104	H	95.0	DH59	41		526														
JUN 01	16:40	17.0	103	H	95.0	DH59	45																
JUN 02	13:10	17.0	110	H	95.0	DH59	58																
JUN 03	14:20	17.0	125	H	95.0	DH59	59																
JUN 04	19:10	18.0	136	H	95.0	DH59	64																
JUN 05	21:40	18.0	134	H	95.0	DH59	38		551														
JUN 06	15:00	18.0	134	H	95.0	DH59	76																
JUN 07	10:00	18.0	140	H	95.0	DH59	72																
JUN 08	10:00	18.0	170	H	95.0	DH59	61																
JUN 08	16:10	18.0	170	H	95.0	DH59	85																
JUN 09	15:20	18.0	185	H	95.0	DH59	84																

CONTINUED

RED RIVER NEAR LOCKPORT - STATION NO. 05OJ010 (CONTINUED)

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)		SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)		DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002 .004 .008 .016 .031 .062 .125 .250 .500 1.00 2.00	PERCENT SAND SILT CLAY
JUN	10 10:05	18.0	192	H	95.0	DH59	99		616		
JUN	12 09:50	20.0	192	H	95.0	DH59	75				
JUN	12 15:50	20.0	192	H	95.0	DH59	54				
JUN	13 10:05	20.0	196	H	95.0	DH59	54		454		
JUN	13 16:30	20.0	196	H	95.0	DH59	53				
JUN	14 09:15	20.0	195	H	95.0	DH59	20				
JUN	14 18:10	20.0	195	H	95.0	DH59	43				
JUN	15 07:35	20.0	183	H	95.0	DH59	60				
JUN	15 16:00	20.0	183	H	95.0	DH59	59				
JUN	16 10:05	21.0	158	H	95.0	DH59	63				
JUN	16 19:15	21.0	158	H	95.0	DH59	63				
JUN	17 08:20	21.0	146	H	95.0	DH59	48				
JUN	18 15:00	21.0	133	H	95.0	DH59	68				
JUN	19 21:10	21.0	126	H	95.0	DH59	72				
JUN	20 10:25	21.0	121	H	95.0	DH59	74				
JUN	21 14:20	21.0	120	H	95.0	DH59	237	G			
JUN	22 09:15	21.0	124	H	95.0	DH59	230	G	489		
JUN	23 10:20	21.0	127	H	95.0	DH59	76				
JUN	24 20:05	21.0	123	H	95.0	DH59	76				
JUN	25 15:05	22.0	120	H	95.0	DH59	65				
JUN	26 18:05	22.0	117	H	95.0	DH59	70				
JUN	27 08:45	22.0	117	H	95.0	DH59	66				
JUN	28 17:15	22.0	120	H	95.0	DH59	80				
JUN	29 09:05	22.0	120	H	95.0	DH59	90				
JUN	30 15:10	23.0	117	H	95.0	DH59	62				
JUL	01 10:20	23.0	110	H	95.0	DH59	62				
JUL	02 13:00	23.0	104	H	95.0	DH59	103				
JUL	09 12:30	21.0	98.3	H	95.0	DH59	55		483		
JUL	16 14:55	24.0	87.0	H	95.0	DH59	56		456		
JUL	25 18:10	24.0	61.1	H	95.0	DH59	76		468		
JUL	28 19:05	24.0	52.6	H	95.0	DH59	110				
JUL	31 09:15	25.0	52.1	H	95.0	DH59	131				
AUG	02 12:20	25.0	48.0	H	95.0	DH59	161		514		
AUG	05 10:20	25.0	45.9	H	95.0	DH59	197	G			
AUG	08 21:00	23.0	38.8	H	95.0	DH59	36		514		
AUG	11 08:45	23.0	36.6	H	95.0	DH59	30				
AUG	13 10:05	24.0	33.9	H	95.0	DH59	56				
AUG	15 09:10	23.0	33.4	H	95.0	DH59	50		565		
AUG	18 10:05	21.0	37.3	H	95.0	DH59	51				
AUG	21 08:15	20.0	28.7	H	95.0	DH59	38				
AUG	24 12:00	23.5	37.5	H	95.0	DH59	36		557		
AUG	24 17:00	23.0	37.5	H	95.0	DH59	37				
AUG	27 15:10	22.0	37.5	H	95.0	DH59	66	G			
AUG	28 16:15	22.0	35.2	H	95.0	DH59	63	G			
SEP	01 14:10	22.0	23.0	H	95.0	DH59	212		853		
SEP	03 18:05	21.0	22.1	H	95.0	DH59	46				
SEP	06 15:20	20.0	24.7	H	95.0	DH59	11		586		
SEP	09 09:10	20.0	25.7	H	95.0	DH59	57				
SEP	12 13:00	20.0	26.0	H	95.0	DH59	61		594		
SEP	15 13:10	19.0	19.9	H	95.0	DH59	76		599		
SEP	18 18:15	19.0	17.5	H	95.0	DH59	86	C			
SEP	21 15:10	17.0	20.7	H	95.0	DH59	43	C	604		
SEP	26 10:15	16.0	28.3	H	95.0	DH59	25				
SEP	26 16:15	16.0	28.3	H	95.0	DH59	56				
SEP	29 10:25	14.0	39.8	H	95.0	DH59	109	C	614		
OCT	02 16:20	14.0	34.1	H	95.0	DH59	72				
OCT	05 13:10	11.0	21.0	H	95.0	DH59	98	C	630		
OCT	08 10:05	11.0	21.0	H	95.0	DH59	119	G			
OCT	11 16:20	10.0	18.8	H	95.0	DH59	30				
OCT	13 13:15	10.0	19.6	H	95.0	DH59	20		540		
OCT	16 12:35	10.0	48.0	H	95.0	DH59	24				
OCT	16 17:00	10.0	48.0	H	95.0	DH59	19				
OCT	17 15:10	10.0	49.3	H	95.0	DH59	17				
OCT	18 13:10	8.0	50.0	H	95.0	DH59	24				
OCT	19 15:15	8.0	48.7	H	95.0	DH59	24				
OCT	20 16:20	8.0	48.5	H	95.0	DH59	24		544		
OCT	21 13:00	8.0	46.9	H	95.0	DH59	24				
OCT	22 10:20	5.0	46.4	H	95.0	DH59	19				
OCT	23 13:20	5.0	46.4	H	95.0	DH59	18				
OCT	24 14:10	5.0	45.2	H	95.0	DH59	13				
OCT	25 15:40	4.0	45.1	H	95.0	DH59	13				
OCT	26 10:05	4.0	44.6	H	95.0	DH59	9				
OCT	27 12:45	4.0	44.4	H	95.0	DH59	12		585		
OCT	28 13:50	5.0	44.5	H	95.0	DH59	15				
OCT	29 14:15	4.0	46.0	H	95.0	DH59	15				
OCT	30 14:10	5.0	48.4	H	95.0	DH59	44	C			
OCT	31 12:10	5.0	49.8	H	95.0	DH59	10				
NOV	01 15:05	4.0	53.2	H	95.0	DH59	52				
NOV	02 10:10	4.0	52.2	H	95.0	DH59	55	C			
NOV	03 15:00	4.0	51.7	H	95.0	DH59	51		616		
NOV	04 13:00	4.0	51.0	H	95.0	DH59	23				
NOV	05 14:10	4.0	50.4	H	95.0	DH59	19				
NOV	06 12:30	4.0	47.0	H	95.0	DH59	15				
NOV	07 13:30	4.0	42.6	H	95.0	DH59	8				
NOV	08 14:05	4.0	35.0	H	95.0	DH59	8				
NOV	09 15:10	3.0	27.4	H	95.0	DH59	16	C			
NOV	10 10:10	3.0	29.5	H	95.0	DH59	6		579		
NOV	11 14:00	3.0	30.3	H	95.0	DH59	9				
NOV	12 10:30	3.0	27.5	H	95.0	DH59	11				
NOV	13 14:00	2.0	29.6	H	95.0	DH59	35				
NOV	14 11:35	2.0	26.4	H	95.0	DH59	75				
NOV	15 12:03	0.0	27.5	H	95.0	DH59	18		636		

NOTE: SINGLE VERTICAL IS LOCATED AT 95.0 METRES FOR 1990

DISCHARGE SYMBOL(S): H - DAILY MEAN W - DAILY MEAN; ICE CONDITIONS

CONCENTRATION SYMBOL(S): C - COARSE MATERIAL PRESENT G - ORGANIC MATERIAL PRESENT

RED RIVER NEAR LOCKPORT - STATION NO. 05OJ010

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)			SAMPLED CONCENTRATION MINIMUM (MG/L)			SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)			SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1962	---PCCCCCCCC	MANUAL	1 230	APR 25		10	OCT 3		183 000	APR 25		2 080 000	---	---	---
1963	CCCCCCCCCCCC	MANUAL	1 590	JUN 8		4	FEB 17		58 200	APR 14		1 300 000	5 250	5 250	---
1964	CCCCCCCCCCCC	MANUAL	2 060	APR 18		5	OCT 4		178 000	APR 18		1 970 000	8 010	6 630	20.8
1965	CCCCCCCCCCCC	MANUAL	2 450	APR 14		10	FEB 27		289 000	APR 16		3 480 000	14 100	9 130	28.7
1966	CCCCCCCCCCCC	MANUAL	1 340	JUL 5		8	DEC 23		137 000	APR 10		4 970 000	12 100	9 860	20.2
1967	CCCCCCCCCCCC	MANUAL	2 110	JUN 2		1	AUG 14	*	139 000	APR 23		2 420 000	9 860	9 860	15.6
1968	CCCCCCCCCCCC	MANUAL	1 300	JUN 16		4	JAN 24		42 300	JUN 16		883 000	3 560	8 810	18.6
1969	CCCCCCCCCCCC	MANUAL	1 700	APR 17		6	FEB 5		234 000	APR 17		3 420 000	14 000	9 550	16.4
1970	CCCCCCCCCCCC	MANUAL	1 210	APR 18		6	OCT 5		140 000	APR 21		3 120 000	12 700	9 940	14.2
1971	CCCCCCCCCCCC	MANUAL	2 540	APR 13		3	FEB 4		304 000	APR 13	*	1 910 000	7 140	9 630	13.4
1972	CCCCCCCCCCCC		769	APR 17		7	OCT 16		68 600	APR 21		1 440 000	5 820	9 550	11.1
1973	CCCCCCCCCCCC		599	MAR 29		2	JAN 19		27 200	MAR 29		256 000	1 000	8 500	15.6
1974	CCCCCCCCCCCC		1 010	APR 24		3	JAN 30		212 000	APR 24		3 370 000	13 700	8 930	14.4
1975	CCCCCCCCCCCC		1 060	APR 24		10	MAR 10		91 700	APR 24		2 070 000	8 290	8 880	13.3
1976	CCCCCCCCCCCC		807	APR 11		10	OCT 19		103 000	APR 9		1 890 000	7 680	8 800	12.5
1977	CCCCCCCCCCCC		141	APR 17		6	MAY 10		5 260	APR 13		51 500	175	8 220	14.3
1978	CCCCCCCCCCCC	MANUAL	844	APR 13		12	FEB 7		115 000	APR 14		2 010 000	8 170	8 220	13.4
1979	CCCCCCCCCCCC	MANUAL	800	APR 22		14	FEB 8		161 000	APR 23		3 710 000	15 100	8 620	12.9
1980	CCCCCCCCCCCC	MANUAL	1 940	APR 13		9	DEC 15		163 000	APR 12		1 460 000	5 920	8 470	12.5
1981	CCCCCCCCCCCC	MANUAL	285	APR 2		7	JAN 14		3 940	APR 2		86 800	321	8 040	13.5
1982	CCCCCCCCCCCC	MANUAL	1 210	APR 17		6	FEB 18		124 000	APR 17		1 540 000	6 160	7 950	13.0
1983	CCCCCCCCCCCC	MANUAL	487	APR 14		10	MAR 4		51 700	APR 10		1 380 000	5 540	7 840	12.7
1984	CCCCCCCCCCCC	MANUAL	1 080	APR 7		11	FEB 10		99 800	APR 7		1 220 000	4 930	7 700	12.4
1985	CCCCCCCCCCCC	MANUAL	1 660	MAY 20		12	MAR 12		64 800	MAY 20		1 530 000	6 140	7 640	12.0
1986	CCCCCCCCCCCC	MANUAL	618	APR 5		7	MAR 6		80 400	APR 5		1 700 000	6 880	7 600	11.5
1987	--CCCCCCCCCC	MANUAL	771	APR 8		9	MAR 25		141 000	APR 8		1 250 000	5 060	7 500	11.3
1988	---CCCCCCCC-	MANUAL	2 860	APR 14	*	8	MAR 1		98 800	APR 14		534 000	2 170	7 300	11.5
1989	--PCCCCCCC--	MANUAL	1 210	APR 20		9	MAY 25		100 000	APR 23		1 360 000	---	---	---
1990	--CCCCCCCCC-	MANUAL	2 160	APR 14		6	NOV 10		44 900	APR 22		479 000	1 950	7 100	11.7

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER NEAR ST. NORBERT - STATION NO. 05OC008

LOCATION: LAT 49 47 10 N LONG 097 08 13 W
DRAINAGE AREA: 122 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: MANUAL

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)			SAMPLED CONCENTRATION MINIMUM (MG/L)			SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)			SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : APR-MAY MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1967	---PP-------	MANUAL	1 150	APR 22		90	MAY 17		---	---		---	---	---	---
1969	---PP-------	MANUAL	1 760	APR 13		82	MAY 15		---	---		---	---	---	---
1970	---PP-------	MANUAL	1 260	APR 20		126	MAY 14		---	---		---	---	---	---
1971	---P--------	MANUAL	2 470	APR 12		408	APR 21		---	---		---	---	---	---
1972	---P--------	MANUAL	652	APR 19		550	APR 16		---	---		---	---	---	---
1974	---PC-------	MANUAL	3 390	APR 24	*	151	MAY 30		175 000	APR 19		1 610 000	* ---	---	---
1975	---PP-------	MANUAL	379	MAY 1		78	MAY 16	*	---	---		---	---	---	---
1976	---P--------	MANUAL	850	APR 11		227	APR 18		---	---		---	---	---	---
1978	---PP-------	MANUAL	851	APR 15		102	MAY 3		---	---		---	---	---	---
1979	---PP-------	MANUAL	867	APR 20		110	MAY 28		---	---		---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

RED RIVER NEAR STE. AGATHE - STATION NO. 05OC012

LOCATION: LAT 49 33 40 N LONG 097 10 52 W
DRAINAGE AREA: 115 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)		SUMMARY : JAN-DEC MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1961	------CCCCCC	MANUAL	50	OCT 20	4	JUL 24	140	OCT 21	5 090		---	---	---
1962	CCCCCCCCCCCC	MANUAL	665	APR 25	5	JAN 30	72 400	APR 25	1 620 000		4 430	4 430	---
1963	CCCCCCCCCCCC	MANUAL	1 680	JUN 6	4	FEB 24	49 800	JUN 6	923 000		2 530	3 480	27.3
1964	CCCCCCCCCCCC	MANUAL	1 510	JUN 14	3	MAR 29	72 800	APR 18	1 130 000		3 090	3 350	16.8
1965	CCCCCCCCCCCC	MANUAL	1 370	APR 14	8	FEB 15	128 000	APR 14	1 850 000		5 060	3 770	15.5
1966	CCCCCCCCCCCC	MANUAL	780	JUL 4	6	MAR 11	49 900	APR 7	1 390 000		3 800	3 780	12.0
1967	CCCCCCCCCCCC	MANUAL	1 340	APR 22	6	FEB 2	124 000	APR 22	1 420 000		3 880	3 800	9.7
1968	CCCCCCCCCCCC	MANUAL	1 360	JUN 14	3	JAN 24	40 200	JUN 14	950 000		2 600	3 620	9.8
1969	CCCCCCCCCCCC	MANUAL	1 820	APR 12	3	FEB 6	127 000	APR 12	1 710 000		4 690	3 760	8.9
1970	CCCCCCCCCCCC	MANUAL	708	APR 20	1	MAR 4 *	66 900	APR 20	1 620 000	*	4 440	3 830	8.0
1971	CCCCCCCCCCCC		2 940	APR 13 *	7	FEB 1 *	307 000	APR 13 *	2 290 000	*	6 260	4 080	9.0
1972	CCCCCCCCCCCC		714	APR 18	9	FEB 17	55 000	APR 18	968 000		2 640	3 950	9.0
1973	CCCCCCCCCCCC		1 860	MAR 30	2	MAR 5	50 200	MAR 28	637 000		1 740	3 760	9.9
1974	CCCCCCCCCCCC		1 430	APR 18	9	SEP 14	132 000	APR 18	2 030 000		5 560	3 900	9.5
1975	CCCCCCCCCCCC		841	APR 25	7	JAN 30	62 800	APR 25	1 280 000		3 520	3 870	8.9
1976	CCCCCCCCCCCC		795	APR 7	12	MAR 7	79 000	APR 7	929 000		2 540	3 780	8.8
1977	CCCCCCCCCCCC		436	MAY 31	4	MAR 16	3 840	APR 13	78 500		215	3 560	10.7
1978	CCCCCCCCCCCC		495	APR 14	10	MAR 21	54 700	APR 14	1 140 000		3 130	3 540	10.2

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

ROSEAU RIVER AT GARDENTON - STATION NO. 05OD004

LOCATION: LAT 49 05 16 N LONG 096 41 15 W
DRAINAGE AREA: 4 390 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)		SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1972	-------CCCC-	MANUAL	25	AUG 13	2	OCT 28	4.1	AUG 13	69.0		---	---	---
1973	---CCCCCCC--	MANUAL	40	OCT 2	1	JUN 16	97.9	OCT 2	2 030		---	---	---
1974	---PCCCCCC-	MANUAL	322	MAY 20 *	4	OCT 30	2 450	MAY 20 *	33 400	*	---	---	---
1975	---CCCCCCCP-	MANUAL	217	APR 22	3	SEP 19	662	MAY 5	20 900		---	---	---
1976	--CCCCCCCC--	MANUAL	240	APR 6	7	AUG 11	728	APR 6	7 320		29.9	29.9	---
1977	--CCCCCCCC--	MANUAL	228	MAY 19	2	MAY 12	42.4	MAY 31	970		3.96	16.9	76.9
1978	--CCCCCCCC--	MANUAL	186	APR 18	6	OCT 5	783	APR 18	10 600		43.1	25.6	44.8
1979	--CCCCCCCC--	MANUAL	197	APR 21	5	JUL 3	654	APR 21	13 700		56.0	33.2	33.4
1980	--CCCCCCCC--	MANUAL	122	APR 13	0	JUL 10 *	314	APR 14	2 100		9.79	26.5	34.3
1981	--CCCCCCCC--	MANUAL	34	JUN 17	5	MAY 26	45.7	JUL 4	1 540		6.27	24.8	35.5
1982	--CCCCCCCC--	MANUAL	80	APR 15	4	JUN 20	250	APR 15	7 020		28.6	25.4	29.5
1983	--CCCCCCCC--	MANUAL	103	APR 7	4	JUN 11	390	APR 8	6 860		28.0	25.7	25.2
1984	-PCCCCCCC--	MANUAL	172	APR 4	3	JUN 2	584	APR 4	7 230		29.5	26.1	21.9
1985	--CCCCCCCP-	MANUAL	193	APR 3	9	MAR 18	262	APR 4	12 400		50.5	28.6	19.9
1986	--CCCCCCCP-	MANUAL	214	MAR 31	8	MAR 17	612	MAR 31	17 200		70.2	32.3	19.7
1987	--CCCCCCCP-	MANUAL	122	APR 7	7	OCT 11	580	APR 8	7 450		30.4	32.2	18.1

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

ROSEAU RIVER NEAR DOMINION CITY - STATION NO. 05OD001

LOCATION: LAT 49 11 53 N LONG 097 03 15 W
DRAINAGE AREA: 5 260 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1972	--------CCCC-	MANUAL	103	SEP 6	6	OCT 27	8.5	AUG 14	224	---	---	---
1973	---CCCCCCC--	MANUAL	136	SEP 30	10	APR 23	229	SEP 30	3 960	---	---	---
1974	---PCCCCCCCC	MANUAL	326	APR 18	5	NOV 30	1 950	APR 18	46 500	---	---	---
1975	---PCCCCCC--	MANUAL	352	JUN 22	12	OCT 3	1 850	MAY 8	49 100 *	---	---	---
1976	--CCCCCCCC--	MANUAL	514	APR 7	16	OCT 8	1 870	APR 7	13 400	56.8	56.8	---
1977	--CCCCCCC--	MANUAL	190	APR 12	10	MAR 1	194	APR 12	1 610	6.57	31.7	79.3
1978	--CCCCCCCC--	MANUAL	131	APR 16	6	OCT 13	1 410	APR 18	25 500	104	55.8	50.4
1979	CCCCCCCCCCCC	MANUAL	297	APR 20	10	JAN 1	1 840	APR 21	37 100	151	79.6	39.0
1980	CCCCCCCCCCCC	MANUAL	349	APR 14	0	JUL 13 *	996	APR 14	5 980	26.8	69.1	38.0
1981	CCCCCCCCCCCC	MANUAL	58	JUL 18	6	OCT 2	75.5	JUL 5	3 610	13.5	59.8	39.0
1982	CCCCCCCCCCCC	MANUAL	396	OCT 9	6	MAR 9	722	APR 18	21 700	85.4	63.5	31.6
1983	CCCCCCCCCCCC	MANUAL	350	APR 9	6	DEC 5	2 920	APR 9 *	24 400	98.6	67.9	26.4
1984	CCCCCCCCCCCC	MANUAL	510	MAY 11	0	FEB 6	969	APR 5	12 700	50.1	65.9	24.2
1985	CCCCPCCCCCCC	MANUAL	5 770	MAY 16 *	6	JAN 15	1 320	APR 5	30 800	---	---	---
1986	CCCCCCCCCCCC	MANUAL	405	MAR 31	7	JAN 9	2 270	MAR 31	48 600	198	79.1	24.5
1987	--CCCCCCCP-	MANUAL	337	APR 8	5	NOV 4	1 740	APR 8	17 400	71.2	78.4	22.4

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

SASKATCHEWAN RIVER AT THE PAS - STATION NO. 05KJ001

LOCATION: LAT 53 50 30 N LONG 101 11 10 W
DRAINAGE AREA: 347 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : JAN-DEC MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1954	-----PCCC---	MANUAL	735	SEP 8	50	AUG 25	118 000	SEP 8	3 740 000	---	---	---
1955	----CCCC----	MANUAL	1 220	MAY 1 *	50	JUL 25	183 000	MAY 1 *	3 930 000	---	---	---
1956	----PCCCP---	MANUAL	555	JUN 18	24	SEP 15	100 000	MAY 17	2 170 000	---	---	---
1957	----CCCC----	MANUAL	900	MAY 1	30	AUG 23	128 000	MAY 1	2 860 000	---	---	---
1958	---PCCCCCP--	MANUAL	740	APR 22	50	AUG 30	95 000	APR 30	4 400 000	---	---	---
1959	------CP-----	MANUAL	680	JUL 9	100	AUG 10	91 000	JUL 10	1 420 000	---	---	---
1960	----CCCC----	MANUAL	675	MAY 1	55	AUG 12	92 700	MAY 1	2 560 000	---	---	---
1962	----PCCCCCCC	MANUAL	530	MAY 5	16	DEC 7	65 900	MAY 5	2 050 000	---	---	---
1963	CCCCCCCCCCCC	MANUAL	380	APR 26	10	MAR 17	36 400	APR 26	2 140 000	6 400	6 400	---
1964	CCCCCCCCCCCC	MANUAL	560	JUN 30	11	APR 9	76 400	JUN 30	3 280 000	8 960	7 680	16.7
1965	CCCCCCCCCCCC	MANUAL	765	MAY 8	10	MAR 22	98 400	JUL 11	6 690 000 *	18 300	11 200	12.3
1966	CCCCCCCCCCCC	MANUAL	265	MAY 4	10	FEB 22	14 100	MAY 4	2 [illegible]50 000	5 640	9 840	29.7
1967	CCCCCCCCCCCC	MANUAL	280	JUN 10	10	APR 9	27 100	JUN 10	1 600 000	4 380	8 740	28.7
1968	CCCCCCCCCCCC	MANUAL	173	MAY 1	11	DEC 6	10 700	APR 30	857 000	2 340	7 680	30.1
1969	CCCCCCCCCCCC	MANUAL	511	JUL 9	10	NOV 26	61 000	APR 23	2 850 000	7 810	7 700	25.4
1970	CCCCCCCCCCCC	MANUAL	383	MAY 10	9	MAR 16	55 300	MAY 10	2 130 000	5 850	7 460	22.9
1971	CCCCCCCCCCCC	MANUAL	362	APR 27	6	DEC 22 *	47 200	APR 27	2 030 000	5 550	7 250	21.0
1972	CCCCCCCCCCCC	MANUAL	585	MAY 2	6	NOV 15	95 400	MAY 3	2 740 000	7 490	7 280	18.7
1973	CCCCCCCCCCCC		290	MAY 22	10	FEB 21	25 000	MAY 22	1 880 000	5 140	7 080	17.6
1974	CCCCCCCCCCCC		873	APR 29	14	DEC 23	173 000	MAY 2	6 230 000	17 100	7 910	17.8
1975	CCCCCCCCCCCC	MANUAL	275	APR 30	14	FEB 9	27 100	APR 30	1 700 000	4 670	7 660	17.2
1976	CCCCCCCCCCCC	MANUAL	144	AUG 29	15	FEB 23	9 590	APR 16	989 000	2 700	7 310	17.4
1977	CCCCCCCCCCCC	MANUAL	168	MAY 7	9	APR 5	11 900	APR 22	871 000	2 390	6 980	17.6
1978	CCCCCCCCCCCC		376	MAY 4	10	JAN 27	43 700	MAY 4	1 700 000	4 660	6 840	17.0
1979	CCCCCCCCCCCC		417	MAY 8	8	APR 16	72 100	MAY 8	1 640 000	4 490	6 700	16.4
1980	CCCCCCCCCCCC	MANUAL	235	APR 22	10	APR 6	21 300	APR 22	1 390 000	3 800	6 540	16.0
1981	CCCCCCCCCCCC	MANUAL	327	OCT 1	10	NOV 30	21 500	AUG 12	1 750 000	4 800	6 450	15.4
1982	CCCCCCCCCCCC	MANUAL	363	OCT 22	9	APR 17	25 000	APR 30	1 390 000	3 810	6 310	15.1
1983	CCCCCCCCCCCC	MANUAL	221	MAY 12	6	APR 2	27 400	MAY 1	1 330 000	3 640	6 190	14.8
1984	CCCCCCCCCCCC	MANUAL	294	APR 17	8	MAR 21	28 200	APR 17	1 230 000	3 360	6 060	14.6
1985	CCCCCCCCCCCC	MANUAL	407	APR 25	33	JAN 8	52 000	APR 23	2 160 000	5 910	6 050	13.9
1986	CCCCCCCCCCCC	MANUAL	342	SEP 29	17	FEB 18	32 700	JUL 26	2 070 000	5 660	6 040	13.4

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

SEINE RIVER DIVERSION NEAR ST. ADOLPHE - STATION NO. 05OE013

LOCATION: LAT 49 41 50 N LONG 097 05 30 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1972	--PPPP-P-P--	MANUAL	832	APR 17	7	MAR 31	---	---	---	---	---	---
1973	--CCCCCCCC--	MANUAL	449	SEP 5	0	MAR 1 *	275	SEP 5	3 440	---	---	---
1974	---CCCP-----	MANUAL	3 570	APR 18	0	APR 1	50 000	APR 18 *	288 000 *	15.1	15.1	---
1975	--CCCCCCC---		3 770	APR 21 *	0	MAR 1	1 890	JUL 1	17 200	---	---	---
1976	--CC--------		353	APR 21	0	MAR 1	538	APR 6	4 280	---	---	---
1977	--CCCCCCCC--		397	SEP 14	0	MAR 1	28.1	SEP 13	322	---	---	---
1978	--CCCCCCCC--		1 440	APR 12	0	MAR 1	4 450	APR 12	32 800	1.47	8.27	82.2
1979	---P--------	MANUAL	1 230	APR 21	178	APR 28	---	---	---	169	61.8	86.9

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

SEINE RIVER DIVERSION NEAR STE. ANNE - STATION NO. 05OH008

LOCATION: LAT 49 39 10 N LONG 096 39 10 W
DRAINAGE AREA: 690 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1972	--PP--------		2 480	APR 16 *	11	APR 3	---	---	---	---	---	---
1973	--CCCCCCCC--		84	JUN 22	0	MAR 1 *	18.1	OCT 15	331	1.86	1.86	---
1974	--CCCCCCCC--		827	APR 18	0	MAR 1	4 060	APR 19 *	28 400 *	355	179	99.0
1975	--CCCCCCCC--		214	JUL 1	0	MAR 1	302	JUL 2	1 570	17.6	125	92.3
1976	--CCCCCCCC--		78	APR 26	0	MAR 1	29.1	APR 22	494	4.94	95.0	91.5
1977	--CCCCCCCC--				0	MAR 1	---	---	---	---	---	---
1978	--CCCCCCCC--		818	APR 14	0	MAR 1	178	APR 10	1 750	19.6	79.9	86.3
1979	--CCCCCCCC--		101	APR 21	0	MAR 1	264	APR 20	2 200	35.5	72.5	78.3

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

MANITOBA

SOURIS RIVER AT WAWANESA - STATION NO. 05NG001

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 49 36 05 N LONG 099 40 55 W
DRAINAGE AREA: 61 100 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 396 TONNES FOR THE PERIOD JAN 01 TO DEC 31

DAY	JAN DAILY DISCHARGE (m³/s)	JAN MEAN CONCENTRATION (mg/L)	JAN DAILY LOAD (t)	FEB DAILY DISCHARGE (m³/s)	FEB MEAN CONCENTRATION (mg/L)	FEB DAILY LOAD (t)	MAR DAILY DISCHARGE (m³/s)	MAR MEAN CONCENTRATION (mg/L)	MAR DAILY LOAD (t)	DAY
1	0.01B	5	0.006*	0 B	0	0	0 B	0	0	1
2	0.01B	5	0.006*	0 B	0	0	0 B	0	0	2
3	0.01B	5	0.006*	0 B	0	0	0 B	0	0	3
4	0.01B	5	0.006*	0 B	0	0	0 B	0	0	4
5	0.01B	5	0.006*	0 B	0	0	0 B	0	0	5
6	0.01B	5	0.006*	0 B	0	0	0 B	0	0	6
7	0.01B	5	0.006*	0 B	0	0	0 B	0	0	7
8	0.01B	5	0.006*	0 B	0	0	0 B	0	0	8
9	0.01B	5	0.006*	0 B	0	0	0 B	0	0	9
10	0.01B	5	0.006*	0 B	0	0	0 B	0	0	10
11	0.01B	5	0.006*	0 B	0	0	0 B	0	0	11
12	0.01B	5	0.006*	0 B	0	0	0.14B	2	0.024	12
13	0.01B	5	0.006*	0 B	0	0	1.61B	15	1.67	13
14	0.01B	4	0.004*	0 B	0	0	3.78B	15 S	4.90	14
15	0.01B	4	0.004*	0 B	0	0	1.90B	12	1.97	15
16	0.01B	4	0.004*	0 B	0	0	1.79B	11	1.70	16
17	0.01B	4	0.004*	0 B	0	0	1.99B	12	2.06	17
18	0.01B	4	0.004*	0 B	0	0	2.11B	11	2.01	18
19	0.01B	4	0.004*	0 B	0	0	2.80B	14	3.39	19
20	0.01B	3	0.003*	0 B	0	0	2.57B	18 S	4.00	20
21	0.01B	3	0.003*	0 B	0	0	1.16B	17	1.70	21
22	0.01B	3	0.003*	0 B	0	0	0.84B	16	1.17	22
23	0.01B	3	0.003*	0 B	0	0	0.67B	16	0.939	23
24	0.01B	3	0.002*	0 B	0	0	0.57B	15	0.746	24
25	0.00B	2	0.002*	0 B	0	0	0.54B	15	0.704	25
26	0.00B	2	0.002*	0 B	0	0	0.54B	14	0.662	26
27	0.00B	1	0.001*	0 B	0	0	0.51B	14	0.619	27
28	0.00B	1	0.001*	0 B	0	0	0.54B	13	0.607	28
29	0.00B	1	0 *				0.59B	15	0.665	29
30	0.00B	0	0 *				0.81B	15	1.06	30
31	0.00B	0	0 *				2.40B	19	3.94	31
TOTAL	0.343		0 *	0		0	27.9		35	

DAY	APR DAILY DISCHARGE (m³/s)	APR MEAN CONCENTRATION (mg/L)	APR DAILY LOAD (t)	MAY DAILY DISCHARGE (m³/s)	MAY MEAN CONCENTRATION (mg/L)	MAY DAILY LOAD (t)	JUN DAILY DISCHARGE (m³/s)	JUN MEAN CONCENTRATION (mg/L)	JUN DAILY LOAD (t)	DAY
1	13.3 B	38	43.7 *	0.61	9	0.475*	0.26	5	0.115	1
2	20.8 B	52	93.5 *	0.57	9 S	0.446*	0.30	6 S	0.156	2
3	14.1 B	51 S	62.1 *	0.53	7	0.326*	0.29	6	0.150	3
4	9.25B	39	31.2 *	0.51	5 S	0.222*	0.30	6	0.160	4
5	7.15B	27 S	16.7 *	0.48	5	0.211*	0.30	6	0.159	5
6	4.94B	22	9.39 *	0.44	5	0.192*	0.28	6 S	0.149	6
7	4.39B	22	8.34 *	0.39	5 S	0.171*	0.27	6	0.142	7
8	2.66B	20	4.60 *	0.33	6	0.174*	0.56	7	0.341	8
9	1.92B	16	2.65 *	0.31	6 S	0.164*	0.64	6 S	0.336	9
10	1.22B	9	0.949*	0.30	5	0.131*	0.53	5	0.233	10
11	0.85B	11 S	0.811*	0.28	5 S	0.124*	0.44	5	0.194	11
12	0.99B	12	1.03 *	0.27	5	0.120*	0.45	6 S	0.236	12
13	1.26B	14 S	1.52 *	0.28	5	0.123*	0.55	5	0.152	13
14	1.62B	12	1.68 *	0.27	5 S	0.119*	0.30	5	0.133	14
15	1.58	12	1.64 *	0.29	5	0.129*	0.27	5	0.120	15
16	1.33	11	1.26 *	0.57	7	0.347*	0.24	5	0.107	16
17	1.32	9	1.03 *	0.67	6 S	0.350*	0.33	7	0.201	17
18	1.17	6 S	0.607*	0.95	7	0.577*	0.41	7	0.253	18
19	1.13	6	0.586*	1.28	7	0.774*	0.34	5 S	0.149	19
20	1.11	6 S	0.575*	1.06	6	0.550*	0.29	4	0.101	20
21	1.05	6	0.544*	0.84	5	0.363*	0.26	4	0.092	21
22	0.95	7 S	0.579*	0.71	5 S	0.308*	0.39	7 S	0.238	22
23	0.92	6	0.481*	0.61	5	0.265*	1.74	15	2.26	23
24	0.85	6	0.442*	0.55	7	0.333*	1.74	16	2.41	24
25	0.90	7 S	0.593*	0.46	9 S	0.360*	1.40	13 S	1.57	25
26	0.89	7	0.544*	0.40	7	0.244*	1.14	10 S	0.985	26
27	0.80	8 S	0.558*	0.36	7	0.221*	0.95	8	0.663	27
28	0.75	8	0.525*	0.33	5 S	0.145*	0.81	8	0.565	28
29	0.68	9	0.531*	0.31	5	0.134*	0.72	7	0.437	29
30	0.66	9 S	0.519*	0.29	5 S	0.126*	0.63	7 S	0.305	30
31			*	0.26	5	0.116*				31
TOTAL	100.686		289 *	15.644		8 *	17.079		13	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

MANITOBA

SOURIS RIVER AT WAWANESA - STATION NO. 05NG001

SUSPENDED SEDIMENT FOR 1990

DAY	JUL DAILY DISCHARGE (m^3/s)	JUL MEAN CONCENTRATION (mg/L)	JUL DAILY LOAD (t)	AUG DAILY DISCHARGE (m^3/s)	AUG MEAN CONCENTRATION (mg/L)	AUG DAILY LOAD (t)	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)	SEP DAILY LOAD (t)	DAY
1	0.58	6	0.304*	0.26	9	0.205*	0.26	12 S	0.279	1
2	0.55	6	0.288*	0.29	11 S	0.280*	0.29	11	0.278	2
3	0.76	9	0.596*	0.29	12	0.308*	0.28	11	0.273	3
4	0.92	12	0.960*	0.29	16	0.408*	0.28	10	0.246	4
5	1.01	13 S	1.13*	0.26	18	0.414*	0.24	9	0.191	5
6	0.92	12	0.954*	0.22	18	0.348*	0.20	9	0.160	6
7	1.32	14	1.60*	0.19	17	0.281*	0.20	8 S	0.138	7
8	1.28	15	1.66*	0.13	17 S	0.201*	0.20	8	0.138	8
9	1.06	11	1.01*	0.09	16	0.137*	0.25	8	0.173	9
10	0.96	9	0.752*	0.09	15	0.122*	0.23	8	0.161	10
11	0.88	8	0.610*	0.11	14	0.142*	0.19	8	0.133	11
12	1.28	9 S	0.995*	0.16	14	0.197*	0.20	8 S	0.138	12
13	1.18	9	0.918*	0.18	14	0.227*	0.16	8	0.128	13
14	1.01	8	0.698*	0.13	11	0.130*	0.17	7	0.108	14
15	0.85	8	0.590*	0.15	7	0.094*	0.14	7	0.090	15
16	0.80	9	0.628*	0.18	7 S	0.111*	0.14	7	0.088	16
17	0.84	12	0.874*	0.16	7	0.102*	0.14	6	0.074	17
18	0.84	13	0.947*	0.13	7	0.083*	0.17	6 S	0.093	18
19	0.78	12	0.815*	0.13	7	0.080*	0.20	6	0.104	19
20	0.67	12 S	0.696*	0.11	7	0.071*	0.20	6	0.105	20
21	0.60	11	0.576*	0.09	8	0.063*	0.20	6	0.107	21
22	0.55	11	0.530*	0.07	8	0.052*	0.19	7	0.120	22
23	0.52	10	0.494*	0.08	10	0.069*	0.18	7	0.114	23
24	0.46	10	0.401*	0.09	12 S	0.098*	0.18	7	0.109	24
25	0.40	10 S	0.351*	0.41	18	0.639*	0.18	7	0.114	25
26	0.35	10	0.303*	0.46	20	0.800*	0.23	8	0.163	26
27	0.34	10	0.294*	0.45	18	0.712*	0.26	9	0.207	27
28	0.32	9	0.251*	0.41	17	0.604*	0.30	10	0.262	28
29	0.30	9	0.233*	0.33	16 S	0.467*	0.35	12 S	0.371	29
30	0.29	9	0.233*	0.31	15	0.406*	0.40	12	0.417	30
31	0.27	9	0.215*	0.28	13	0.318*				31
TOTAL	22.991		21 *	6.679		8 *	6.77		5	

DAY	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	NOV DAILY DISCHARGE (m^3/s)	NOV MEAN CONCENTRATION (mg/L)	NOV DAILY LOAD (t)	DEC DAILY DISCHARGE (m^3/s)	DEC MEAN CONCENTRATION (mg/L)	DEC DAILY LOAD (t)	DAY
1	0.38	10	0.332*	0.60	6	0.311*	0.27	5	0.119	1
2	0.37	6	0.192*	0.58	6	0.301*	0.24	5	0.108	2
3	0.37	5 S	0.161*	0.53	6	0.275*	0.23	5	0.101	3
4	0.33	5	0.145*	0.50	6	0.261*	0.24	5	0.108	4
5	0.34	5	0.149*	0.48	6	0.249*	0.26	5	0.114	5
6	0.35	4	0.122*	0.42	6	0.221*	0.27	5	0.121	6
7	0.34	4	0.120*	0.45	6	0.237*	0.27	5	0.120	7
8	0.32	4	0.112*	0.43	6	0.223*	0.28	5	0.124	8
9	0.32	4	0.111*	0.38	5	0.165*	0.31	4	0.108	9
10	0.33	4	0.116*	0.60	5	0.260*	0.34	4	0.120	10
11	0.33	4 S	0.117*	1.01	5	0.436*	0.34	4 S	0.119	11
12	0.33	4	0.114*	1.10	5	0.475*	0.32	4	0.111	12
13	0.30	4	0.107*	1.06	5 S	0.458*	0.33	4	0.116	13
14	0.32	3	0.085*	0.97	5	0.422*	0.33	4	0.114	14
15	0.32	3	0.083*	0.88	5	0.382*	0.29	4	0.103	15
16	0.30	3	0.080*	0.79	5	0.345*	0.27	4	0.095	16
17	0.30	3	0.078*	0.78	5	0.340*	0.27	4	0.094	17
18	0.30	3	0.080*	0.78	5	0.339*	0.26	4	0.090	18
19	0.31	3	0.082*	0.72	5	0.313*	0.27	4	0.094	19
20	0.31	3	0.082*	0.62B	5	0.269*	0.27	3	0.072	20
21	0.31	3	0.082*	0.68B	5	0.297*	0.28	3	0.074	21
22	0.31	3	0.081*	0.33B	5	0.146*	0.27	3	0.071	22
23	0.33	3	0.088*	0.44	5	0.193*	0.23	3	0.062	23
24	0.32	3	0.226*	0.40	5	0.176*	0.20	3	0.052	24
25	0.55	7	0.333*	0.35	5	0.151*	0.18	3	0.049	25
26	0.56	7	0.340*	0.35	5	0.151*	0.19	3	0.051	26
27	0.55	7	0.337*	0.36	5	0.159*	0.20	3	0.052	27
28	0.56	7	0.344*	0.31	5	0.134*	0.21	3	0.055	28
29	0.59	7	0.359*	0.27	5	0.119*	0.23	3	0.062	29
30	0.57	7	0.350*	0.27	5	0.120*	0.25	3	0.065	30
31	0.57	6	0.296*				0.21	3	0.056	31
TOTAL	12.137		5 *	17.551		8 *	8.264		3	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

SOURIS RIVER AT WAWANESA - STATION NO. 05NG001

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m^3/s)	SINGLE SAMPLING VERTICAL (m)	TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)	DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	PERCENT SILT	PERCENT CLAY
MAR 14	11:30	0.5	3.76 B	MID	DH48	14	759														
MAR 20	13:00	0.5	2.19 B	MID	DH48	17	583														
APR 03	15:45	4.0	18.0 B	38.0	DH59	51	224														
APR 05	10:40	2.0	5.92 B	38.0	DH59	34															
APR 11	09:00	1.0	0.565B	MID	DH48	12	308														
APR 13	10:00	1.0	0.701B	38.0	DH59	14															
APR 18	08:00	4.0	1.20	38.0	DH59	6	372														
APR 20	08:00	6.0	1.09	38.0	DH59	6															
APR 22	09:00	8.0	0.967	38.0	DH59	7															
APR 25	12:15	15.0	0.981	38.0	DH59	7	425														
APR 27	14:15	8.0	0.788	38.0	DH59	8															
APR 30	11:00	5.0	0.684	38.0	DH59	9															
MAY 02	10:00	7.0	0.576	38.0	DH59	9	495														
MAY 04	09:00	10.0	0.521	38.0	DH59	5															
MAY 07	08:00	12.0	0.402	38.0	DH59	5															
MAY 09	09:00	10.0	0.320	38.0	DH59	6	542														
MAY 09	10:00	9.0	0.320	38.0	DH59	6															
MAY 11	10:00	12.0	0.283	38.0	DH59	5															
MAY 14	08:00	12.0	0.276	38.0	DH59	5	569														
MAY 17	17:00	13.0	0.666	38.0	DH59	6															
MAY 22	12:00	17.0	0.712	38.0	DH59	6	637														
MAY 25	09:00	18.0	0.482	38.0	DH59	5															
MAY 28	09:00	19.0	0.337	38.0	DH59	5															
MAY 30	09:30	19.0	0.291	38.0	DH59	5	714														
JUN 02	14:00	18.0	0.316	38.0	DH59	6															
JUN 06	09:00	17.0	0.287	38.0	DH59	6	714														
JUN 09	11:00	22.0	0.633	38.0	DH59	5															
JUN 12	08:00	20.0	0.466	38.0	DH59	6															
JUN 19	07:00	21.0	0.364	38.0	DH59	5															
JUN 22	11:00	21.0	0.387	38.0	DH59	7															
JUN 25	10:00	25.0	1.43	38.0	DH59	13	705														
JUN 26	13:00	26.0	1.14	38.0	DH59	9															
JUN 30	10:00	27.0	0.647	38.0	DH59	7															
JUL 05	10:00	26.0	1.01	38.0	DH59	13															
JUL 12	11:00	24.0	1.31	38.0	DH59	9	573														
JUL 20	11:00	22.0	0.664	38.0	DH59	12	616														
JUL 25	11:00	25.0	0.411	38.0	DH59	10															
AUG 02	09:00	22.0	0.292	38.0	DH59	11	588														
AUG 08	11:00	23.0	0.136	38.0	DH59	17															
AUG 16	09:00	23.0	0.189	38.0	DH59	7															
AUG 24	10:00	20.0	0.067	38.0	DH59	12															
AUG 29	09:00	19.0	0.342	38.0	DH59	16	574														
SEP 01	09:00	18.0	0.267	38.0	DH59	12															
SEP 07	09:00	20.0	0.201	38.0	DH59	8	589														
SEP 12	11:00	17.0	0.205	38.0	DH59	8	605														
SEP 18	10:00	15.0	0.160	38.0	DH59	6															
SEP 29	14:00	16.0	0.369	38.0	DH59	12	596														
OCT 03	11:00	10.0	0.383	38.0	DH59	5															
OCT 11	09:00	6.0	0.340	38.0	DH59	4	593														
NOV 13	14:00	1.0	0.928	38.0	DH59	5	782														
DEC 11	09:30	0.5	0.341	MID	DH48	4	944														

NOTE: SINGLE VERTICAL IS LOCATED AT 38 METRES FOR 1990

DISCHARGE SYMBOL(S): B - ICE CONDITIONS

SOURIS RIVER AT WAWANESA - STATION NO. 05NG001

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)	SAMPLED CONCENTRATION MINIMUM (MG/L)	SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)	SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1980	---CCCCCCCCC	MANUAL	211 DEC 12	5 MAY 12	62.5DEC 12	1 750	---	---	---
1981	CCCCCCCCCCCC	MANUAL	170 JAN 1	5 DEC 15	80.4MAR 20	2 270	---	---	---
1982	CCCCCCCCCCCC	MANUAL	950 APR 15	5 JAN 1	9 520 APR 15	42 700	---	---	---
1983	CCCCCCCCCCCC	MANUAL	904 APR 7	7 JUL 8	4 950 APR 8	67 700 *	---	---	---
1984	CCCCCCCCCCCC	MANUAL	152 DEC 6	5 SEP 26	66.8MAR 24	4 350	---	---	---
1985	CCCCCCCCCCCC	MANUAL	551 MAR 26	4 JUN 30	4 860 MAR 26	21 700	---	---	---
1986	CCCCCCCCCCCC	MANUAL	402 MAY 7	9 NOV 3	1 910 MAY 7	13 300	---	---	---
1987	CCCCCCCCCCCC	MANUAL	2 460 APR 6 *	4 NOV 8	11 900 APR 6 *	51 700	---	---	---
1988	CCCCCCCCCCCC	MANUAL	31 JUL 9	2 DEC 6	6.8JUL 9	207	---	---	---
1989	CCCCCCCCCCCC	MANUAL	592 APR 5	3 NOV 3	4 630 APR 5	17 400	---	---	---
1990	CCCCCCCCCCCC	MANUAL	52 APR 2	0 JAN 30 *	93.5APR 2	395	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

MANITOBA

SOURIS RIVER NEAR COULTER - STATION NO. 05NF016

SUSPENDED SEDIMENT FOR 1990

LOCATION: LAT 49 05 27 N LONG 100 57 12 W
DRAINAGE AREA: 44 000 km²
TYPE OF FLOW: REGULATED SINCE
TYPE OF GAUGE: RECORDING

TOTAL SUSPENDED SEDIMENT LOAD 149 TONNES FOR THE PERIOD JAN 01 TO DEC 31

DAY	JAN DAILY DISCHARGE (m³/s)	JAN MEAN CONCENTRATION (mg/L)	JAN DAILY LOAD (t)	FEB DAILY DISCHARGE (m³/s)	FEB MEAN CONCENTRATION (mg/L)	FEB DAILY LOAD (t)	MAR DAILY DISCHARGE (m³/s)	MAR MEAN CONCENTRATION (mg/L)	MAR DAILY LOAD (t)	DAY
1	0 B	0	0	0 B	0	0	0 B	0	0	1
2	0 B	0	0	0 B	0	0	0 B	0	0	2
3	0 B	0	0	0 B	0	0	0 B	0	0	3
4	0 B	0	0	0 B	0	0	0 B	0	0	4
5	0 B	0	0	0 B	0	0	0 B	0	0	5
6	0 B	0	0	0 B	0	0	0 B	0	0	6
7	0 B	0	0	0 B	0	0	0 B	0	0	7
8	0 B	0	0	0 B	0	0	0 B	0	0	8
9	0 B	0	0	0 B	0	0	0 B	0	0	9
10	0 B	0	0	0 B	0	0	0 B	0	0	10
11	0 B	0	0	0 B	0	0	0 B	0	0	11
12	0 B	0	0	0 B	0	0	0 B	0	0	12
13	0 B	0	0	0 B	0	0	0 B	0	0	13
14	0 B	0	0	0 B	0	0	0 B	3	0	14
15	0 B	0	0	0 B	0	0	0.01B	16	0.017	15
16	0 B	0	0	0 B	0	0	0.03B	26	0.088	16
17	0 B	0	0	0 B	0	0	0.04B	32	0.124	17
18	0 B	0	0	0 B	0	0	0.04B	37	0.147	18
19	0 B	0	0	0 B	0	0	0.04B	42	0.167	19
20	0 B	0	0	0 B	0	0	0.05B	52	0.261	20
21	0 B	0	0	0 B	0	0	0.11B	64	0.652	21
22	0 B	0	0	0 B	0	0	0.18B	79	1.23	22
23	0 B	0	0	0 B	0	0	0.20B	89	1.54	23
24	0 B	0	0	0 B	0	0	0.18B	88	1.42	24
25	0 B	0	0	0 B	0	0	0.15B	84	1.12	25
26	0 B	0	0	0 B	0	0	0.13B	80	0.905	26
27	0 B	0	0	0 B	0	0	0.12B	77	0.812	27
28	0 B	0	0	0 B	0	0	0.11B	73	0.744	28
29	0 B	0	0				0.10B	70	0.659	29
30	0 B	0	0				0.10B	66 S	0.599	30
31	0 B	0	0				0.12B	60	0.648	31
TOTAL	0		0	0		0	1.795		11	

DAY	APR DAILY DISCHARGE (m³/s)	APR MEAN CONCENTRATION (mg/L)	APR DAILY LOAD (t)	MAY DAILY DISCHARGE (m³/s)	MAY MEAN CONCENTRATION (mg/L)	MAY DAILY LOAD (t)	JUN DAILY DISCHARGE (m³/s)	JUN MEAN CONCENTRATION (mg/L)	JUN DAILY LOAD (t)	DAY
1	0.15B	48	0.655*	0.01	56	0.068*	0.59	17	0.877	1
2	0.16B	38	0.555*	0.00	61 S	0.042*	0.55	13	0.621	2
3	0.12B	33	0.348*	0.01	60	0.052*	0.63	32	1.74	3
4	0.10B	29 S	0.268*	0.01	61	0.095*	0.66	30 S	1.73	4
5	0.09	26	0.216*	0.00	64	0.017*	0.69	20	1.21	5
6	0.13	24	0.270*	0.01	76	0.112*	0.75	15	0.975	6
7	0.10	23	0.215*	0.00	55	0.043*	0.70	12	0.730	7
8	0.11	23	0.223*	0.00	49	0.017*	0.69	10 S	0.603	8
9	0.05	23	0.101*	0.00	30	0.008*	0.67	11	0.641	9
10	0.03	26	0.088*	0.02	40 S	0.069*	0.65	37	2.08	10
11	0.05	37	0.163*	0.01	33	0.034*	0.53	29 S	1.34	11
12	0.08	49	0.373*	0.02	33	0.063*	0.60	30	1.56	12
13	0.05	53 S	0.256*	0.00	28	0.010*	0.57	38 S	1.90	13
14	0.02	69	0.173*	0.02	30 S	0.052*	0.60	35	1.81	14
15	0.02	86 S	0.208*	0.02	54	0.117*	0.65	29	1.64	15
16	0.01	81	0.070*	0.00	62	0.048*	0.63	21	1.14	16
17	0.05	87 S	0.443*	0.00	50 S	0.039*	0.73	11 S	0.700	17
18	0.06	92	0.533*	0.26	74	1.66 *	0.74	22	1.42	18
19	0.00	80 S	0.062*	0.20	43	0.765*	0.60	23 S	1.20	19
20	0.01	86 S	0.126*	0.18	29	0.464*	0.60	24	1.25	20
21	0.00	67	0.041*	0.09	26 S	0.218*	0.62	25 S	1.35	21
22	0.00	50 S	0.022*	0.02	28	0.058*	0.62	20	1.08	22
23	0.00	49	0.021*	0.02	38	0.085*	0.65	7	0.398	23
24	0.00	42	0.022*	0.16	58	0.847*	0.56	7 S	0.342	24
25	0.00	45	0.023*	0.11	34	0.344*	0.49	8	0.345	25
26	0.00	50 S	0.009*	0.06	22	0.114*	0.49	11 S	0.473	26
27	0.00	40	0.007*	0.05	16 S	0.071*	0.57	15	0.744	27
28	0.00	53	0.041*	0.04	12	0.044*	0.49	19	0.804	28
29	0.01	78 S	0.074*	0.05	10	0.049*	0.59	21	1.07	29
30	0.00	54	0.033*	0.10	8	0.072*	0.65	24	1.35	30
31				0.36	15 S	0.476*				31
TOTAL	1.57		6 *	1.972		6 *	18.697		33	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

SOURIS RIVER NEAR COULTER - STATION NO. 05NF016

SUSPENDED SEDIMENT FOR 1990

DAY	JUL DAILY DISCHARGE (m^3/s)	JUL MEAN CONCENTRATION (mg/L)	JUL DAILY LOAD (t)	AUG DAILY DISCHARGE (m^3/s)	AUG MEAN CONCENTRATION (mg/L)	AUG DAILY LOAD (t)	SEP DAILY DISCHARGE (m^3/s)	SEP MEAN CONCENTRATION (mg/L)	SEP DAILY LOAD (t)	DAY
1	0.73	25	1.59	0.75	7 S	0.458	0.30	15	0.398	1
2	0.64	20	1.11	0.73	8	0.505	0.39	28	0.943	2
3	0.67	15 S	0.877	0.70	7	0.423	0.24	20	0.410	3
4	0.68	13	0.765	0.72	7	0.435	0.24	21	0.437	4
5	0.63	16	0.878	0.78	8	0.545	0.27	25	0.594	5
6	0.69	37	2.22	0.79	10	0.683	0.20	14	0.248	6
7	0.59	14 S	0.721	0.79	17	1.17	0.23	12	0.244	7
8	0.61	9	0.481	0.60	11 S	0.570	0.21	13 S	0.243	8
9	0.64	11	0.614	0.63	11	0.604	0.20	9	0.158	9
10	0.66	12 S	0.688	0.68	12	0.705	0.23	15	0.310	10
11	0.61	16	0.847	0.68	12 S	0.713	0.20	13 S	0.227	11
12	0.65	26 S	1.47	0.69	12	0.717	0.27	19	0.451	12
13	0.75	40	2.60	0.72	15	0.933	0.16	15	0.216	13
14	0.66	26	1.50	0.61	13 S	0.695	0.20	11	0.192	14
15	0.61	24	1.27	0.76	17	1.13	0.16	10	0.146	15
16	0.63	28 S	1.54	0.53	8	0.371	0.21	9	0.169	16
17	0.58	22	1.12	0.48	5	0.209	0.19	7 S	0.115	17
18	0.60	13	0.680	0.59	5	0.258	0.18	6	0.093	18
19	0.61	12	0.638	0.70	7	0.425	0.19	9 S	0.154	19
20	0.60	14 S	0.732	0.71	7	0.431	0.18	16	0.256	20
21	0.59	17	0.880	0.73	7 S	0.446	0.25	22	0.479	21
22	0.61	21	1.12	0.69	7	0.421	0.21	27	0.504	22
23	0.66	24	1.37	0.58	7 S	0.353	0.21	30 S	0.544	23
24	0.70	27	1.63	0.59	12	0.621	0.16	25	0.352	24
25	0.67	28 S	1.63	0.53	25	1.16	0.17	10	0.154	25
26	0.73	28	1.78	0.48	25	1.05	0.05	4 S	0.018	26
27	0.77	19	1.28	0.47	23 S	0.950	0.07	5	0.030	27
28	0.74	12 S	0.770	0.46	20	0.800	0.10	5	0.043	28
29	0.71	10	0.620	0.43	17	0.633	0.20	6 S	0.104	29
30	0.75	9	0.588	0.42	15 S	0.551	0.30	12	0.311	30
31	0.76	8	0.529	0.31	13	0.356				31
TOTAL	20.684		35	19.468		19	6.278		9	

DAY	OCT DAILY DISCHARGE (m^3/s)	OCT MEAN CONCENTRATION (mg/L)	OCT DAILY LOAD (t)	NOV DAILY DISCHARGE (m^3/s)	NOV MEAN CONCENTRATION (mg/L)	NOV DAILY LOAD (t)	DEC DAILY DISCHARGE (m^3/s)	DEC MEAN CONCENTRATION (mg/L)	DEC DAILY LOAD (t)	DAY
1	0.38	21 S	0.697	0.34	7 S	0.209	0.03B	4	0.012	1
2	0.44	22	0.846	0.46	9	0.360	0.03B	4	0.012	2
3	0.40	24	0.836	0.53	7	0.324	0.03B	3	0.009	3
4	0.42	26	0.943	0.61	7	0.371	0.03B	3	0.009	4
5	0.42	26	0.964	0.62	7	0.379	0.03B	3	0.008	5
6	0.43	28	1.05	0.61	7	0.374	0.03B	3	0.008	6
7	0.51	29 S	1.29	0.60	7	0.368	0.02B	3	0.007	7
8	0.53	28	1.30	0.60	7	0.363	0.02B	3	0.006	8
9	0.56	25	1.22	0.43	7	0.263	0.01B	3	0.003	9
10	0.56	21 S	1.02	0.26	6	0.135	0.00B	3	0.002	10
11	0.47	22	0.905	0.15	6	0.082	0.00B	3	0.002	11
12	0.39	33	1.71	0.10	5	0.046	0.00B	2	0.001	12
13	0.51	17	0.762	0.08	4	0.029	0.00B	2	0.001	13
14	0.44	11 S	0.424	0.07	4	0.026	0.00B	2	0.001	14
15	0.51	10	0.442	0.07	4	0.026	0.00B	2	0.001	15
16	0.44	9	0.344	0.08	4	0.028	0.00B	2	0.001	16
17	0.39	8 S	0.271	0.08	4	0.031	0.00B	1	0	17
18	0.62	25	1.35	0.09	4	0.033	0.00B	1	0	18
19	0.46	28	1.13	0.08	4	0.030	0.00B	1	0	19
20	0.33	24	0.688	0.07	4	0.027	0 B	0	0	20
21	0.44	42 S	1.60	0.08	4	0.030	0 B	0	0	21
22	0.36	37	1.18	0.07	4	0.026	0 B	0	0	22
23	0.36	23	0.725	0.06	4	0.021	0 B	0	0	23
24	0.42	12 S	0.445	0.05	4	0.018	0 B	0	0	24
25	0.42	24	0.883	0.04B	4	0.016	0 B	0	0	25
26	0.35	17	0.521	0.04B	4	0.016	0 B	0	0	26
27	0.32	8 S	0.224	0.04B	4	0.015	0 B	0	0	27
28	0.48	33	1.39	0.04B	3	0.011	0 B	0	0	28
29	0.32	30	0.835	0.04B	3	0.011	0 B	0	0	29
30	0.36	17	0.529	0.03B	4	0.013	0 B	0	0	30
31	0.34	11	0.327				0 B	0	0	31
TOTAL	13.725		27	6.57		4	0.306		0	

B - ICE CONDITIONS

S - SAMPLE(S) COLLECTED THIS DAY

SOURIS RIVER NEAR COULTER - STATION NO. 05NF016

INSTANTANEOUS SUSPENDED SEDIMENT FOR 1990

DATE	TIME	WATER TEMP. (C)	INSTANT DISCHARGE (m³/s)	SINGLE VERTICAL SAMPLING (m)		TYPE OF SAMPLER	INSTANT CONCENT. (mg/L)		DISSOLVED SOLIDS (mg/L)	PERCENT FINER THAN INDICATED SIZE, IN MILLIMETRES .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	PERCENT SAND	SILT	CLAY
MAR 30	09:45	1.0	0.092B	WERB	X	DIP	66	C																
APR 04	14:40	2.0	0.077B	WERB	X	DIP	28																	
APR 13	17:00	9.0	0.037	MID		DH59	52		910															
APR 15	16:30	9.0	0.028A	MID		DH59	86																	
APR 15	16:31	9.0	0.028A	WERB	X	DIP	84																	
APR 17	19:00	8.0	0.059	MID		DH59	88																	
APR 19	09:00	7.0	0.009A	MID		DH59	79																	
APR 20	20:30	14.0	0.025	WERB	X	DIP	85																	
APR 22	17:15	23.0	0.005	WERB	X	DIP	49																	
APR 26	21:00	7.5	0.004	WERB	X	DIP	44																	
APR 29	21:00	7.0	0.021	MID		DH59	84		999															
MAY 02	21:10	8.0	0.008A	MID		DH59	61																	
MAY 10	20:15	8.0	0.034	MID		DH59	45																	
MAY 14	20:40	15.0	0.019	WERB	X	DIP	31																	
MAY 17	10:20	10.0	0.009A	MID		DH59	50																	
MAY 17	10:21	10.0	0.009A	MID		DH59	47																	
MAY 21	20:40	16.5	0.050	MID		DH59	26		1517															
MAY 27	20:45	20.5	0.058	MID		DH59	14		1647															
MAY 31	20:30	20.0	0.622	MID		DH59	21																	
JUN 04	21:00	16.5	0.631	MID		DH59	24		766															
JUN 08	20:30	19.5	0.755	MID		DH59	7																	
JUN 08	20:31	19.5	0.755	MID		DH59	10																	
JUN 11	20:45	21.5	0.588	MID		DH59	23		703															
JUN 13	20:00	20.5	0.579	MID		DH59	37	C																
JUN 17	20:10	19.0	0.748	MID		DH59	8		711															
JUN 19	20:10	21.5	0.565	MID		DH59	23																	
JUN 21	20:15	22.0	0.614	MID		DH59	25																	
JUN 24	19:15	26.0	0.517	MID		DH59	7		680															
JUN 26	13:20	26.0	0.464	MID		DH59	11																	
JUL 03	22:00	23.5	0.701	MID		DH59	13		682															
JUL 07	19:40	23.0	0.580	MID		DH59	8																	
JUL 10	21:55	22.0	0.648	MID		DH59	12		677															
JUL 12	21:50	22.5	0.679	MID		DH59	33																	
JUL 16	17:00	22.0	0.666	MID		DH59	30		756															
JUL 20	17:00	20.0	0.599	MID		DH59	14																	
JUL 25	21:40	23.0	0.679	MID		DH59	29		794															
JUL 28	16:00	22.5	0.714	MID		DH59	11																	
AUG 01	21:45	22.5	0.730	MID		DH59	7		777															
AUG 08	21:00	21.0	0.580	MID		DH59	8		786															
AUG 11	18:00	19.0	0.626	MID		DH59	12																	
AUG 14	10:00	19.0	0.629	MID		DH59	12		836															
AUG 21	19:30	22.0	0.755	MID		DH59	7																	
AUG 23	20:00	23.0	0.591	MID		DH59	7		845															
AUG 27	18:30	21.0	0.443	MID		DH59	22																	
AUG 30	19:30	21.0	0.433	MID		DH59	14		880															
SEP 08	19:15	20.0	0.213	MID		DH59	9		870															
SEP 11	19:00	20.0	0.257	MID		DH59	12																	
SEP 17	08:00	18.0	0.188	MID		DH59	8																	
SEP 19	19:00	17.0	0.192	MID		DH59	11		878															
SEP 23	18:45	12.5	0.203	MID		DH59	30																	
SEP 26	10:00	15.0	0.024	MID		DH59	4		917															
SEP 29	16:45	12.0	0.200H	MID		DH59	6																	
OCT 01	17:30	12.0	0.407	MID		DH59	21																	
OCT 07	18:20	7.0	0.512	MID		DH59	29		937															
OCT 10	17:00	8.0	0.488	MID		DH59	20																	
OCT 14	14:00	6.0	0.367	MID		DH59	11		975															
OCT 17	18:00	2.0	0.324	MID		DH59	7																	
OCT 21	13:30	2.0	0.492	MID		DH59	43		933															
OCT 24	16:40	3.5	0.440	MID		DH59	9		960															
OCT 27	16:46	4.5	0.363	MID		DH59	10		965															
NOV 01	13:40	5.0	0.320	MID		DH59	7		944															

NOTE: SINGLE VERTICAL LOCATED AT MID (MID STREAM) FOR 1990

DISCHARGE SYMBOL(S): A - MANUAL GAUGE B - ICE CONDITIONS H - DAILY MEAN
CONCENTRATION SYMBOL(S): C - COARSE MATERIAL PRESENT
VERTICAL SYMBOL(S): X - NOT AT REGULAR SINGLE SAMPLE VERTICAL

SOURIS RIVER NEAR COULTER - STATION NO. 05NF016

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)				SAMPLED CONCENTRATION MINIMUM (MG/L)				SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)				SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)		SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	STANDARD ERROR OF MEAN %
1977	--CCCCCCCCCC	MANUAL	175	APR	8		10	DEC	16		11.7	MAR	14		425		1.59	1.59	---
1978	CCCCCCCCCCCC	MANUAL	90	APR	17		9	JUL	23		173	APR	17		3 920		15.5	8.53	81.3
1979	CCCCCCCCCCCC	MANUAL	174	JAN	23		0	DEC	17	*	614	MAY	25	*	22 200	*	87.7	34.9	76.4
1980	CCCCCCCCCCCC	MANUAL	477	APR	9		0	JAN	1		183	APR	10		6 900		19.5	31.1	62.0
1981	CCCCCCCCCCCC	MANUAL	326	FEB	21		0	DEC	24		88.7	FEB	21		2 890		7.40	26.3	59.4
1982	CCCCCCCCCCCC	MANUAL	245	SEP	7		0	JAN	1		214	APR	24		8 980		17.8	28.2	45.7
1983	CCCCCCCCCCCC	MANUAL	284	NOV	4		4	MAY	1		211	OCT	23		10 400		35.5	29.3	37.5
1984	CCCCCCCCCCCC	MANUAL	496	APR	26	*	7	AUG	7		156	MAY	1		4 330		15.3	27.5	35.1
1985	CCCCCCCCCCCC	MANUAL	218	OCT	31		8	FEB	18		169	MAR	30		6 170		24.3	27.2	31.4
1986	CCCCCCCCCCCC	MANUAL	186	MAY	5		2	JUN	23		201	APR	23		4 630		18.5	26.3	29.2
1987	CCCCCCCCCCCC	MANUAL	109	OCT	3		2	FEB	18		81.7	APR	21		4 140		15.7	25.4	27.6
1988	CCCCCCCCCCCC	MANUAL	359	MAR	25		0	APR	13		12.3	OCT	21		1 000		2.84	23.5	28.4
1989	CCCCCCCCCCCC	MANUAL	194	APR	3		0	JAN	1		181	APR	4		2 150		9.95	22.4	27.7
1990	CCCCCCCCCCCC	MANUAL	92	APR	18		0	JAN	1		2.6	JUL	13		149		0.629	20.9	28.6

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

SOURIS RIVER NEAR LAUDER - STATION NO. 05NG025

LOCATION: LAT 49 24 00 N LONG 100 45 37 W
DRAINAGE AREA: 51 700 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1983	--CCCCCCCCP-	MANUAL	80 APR 26		11 JUL 31		526 APR 26	*	15 500 *	63.2	63.2	---
1984	-PCCCCCCCC--	MANUAL	282 MAY 7	*	12 FEB 29		184 JUN 8		7 130	29.1	46.2	36.9
1985	--CCCCCCCC--	MANUAL	222 APR 14		8 JUN 26	*	280 MAR 28		5 370	21.9	38.1	33.4
1986	--CCCCCCCCPP	MANUAL	149 APR 9		12 JUL 14		117 MAY 8		6 580	26.8	35.3	26.7
1987	PPCCCCCCCCP-	MANUAL	103 AUG 19		9 FEB 18		371 APR 9		11 900	48.5	37.9	20.5

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

SOURIS RIVER NEAR MINTO - STATION NO. 05NG026

LOCATION: LAT N LONG W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1983	--CCCCCCCC--	MANUAL	292 APR 6		8 JUL 7		---	---	---	---	---	---
1984	--CCCCCCCC--	MANUAL	52 JUN 22		5 MAR 1		---	---	---	---	---	---
1985	--CCCCCCCCP-	MANUAL	175 APR 2		7 JUL 12		---	---	---	---	---	---
1986	--CCCCCCCC-P	MANUAL	303 MAY 6	*	6 DEC 8		---	---	---	---	---	---
1987	PPCCCCCCCCP-	MANUAL	170 APR 7		4 OCT 30	*	---	---	---	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

SOURIS RIVER NEAR WESTHOPE - STATION NO. 05NF012

LOCATION: LAT 48 59 47 N LONG 100 57 29 W
DRAINAGE AREA: 43 700 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1956	-------PPPPP	MANUAL	161 NOV 6		12 AUG 14		---	---	---	---	---	---
1957	PPPPPPPPP---	MANUAL	225 FEB 7		16 JUL 12		---	---	---	---	---	---
1958	---PPPPPPP--	MANUAL	90 JUN 11		23 SEP 4		---	---	---	---	---	---
1959	---PPPPP-----	MANUAL	81 JUN 17		9 AUG 27		---	---	---	---	---	---
1974	---------PPP	MANUAL	36 DEC 18		8 NOV 20	*	---	---	---	---	---	---
1975	PPPPPPPPPPPP	MANUAL	318 FEB 20		11 DEC 23		---	---	---	---	---	---
1976	------PCCC--	MANUAL	381 SEP 15	*	22 AUG 3		348 AUG 30	*	6 550 *	---	---	---

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

SOUTH BAY DIVERSION CHANNEL AT SOUTH BAY - STATION NO. 05EC002

LOCATION: LAT 56 39 15 N LONG 099 03 06 W
DRAINAGE AREA:
TYPE OF FLOW: REGULATED SINCE 1976
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	SUMMARY : HISTORICAL MEAN LOAD (TONNES)	SUMMARY : STANDARD ERROR OF MEAN %
1977	-----CCCC---		41	AUG 10	18	JUN 29	---	---	---	---	---	---
1978	----PCCC----		45	AUG 5 *	6	MAY 17	---	---	---	---	---	---
1979	-----CCCC---		15	JUL 13	5	JUN 1	---	---	---	---	---	---
1980	----PPPPPP--		39	AUG 22	9	JUN 9	---	---	---	---	---	---
1981	-----P-PP---		9	AUG 11	4	JUN 8 *	---	---	---	---	---	---

C - COMPLETE MONTH
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

SOUTH TOBACCO CREEK NEAR MIAMI - STATION NO. 05OF017

LOCATION: LAT 49 22 50 N LONG 098 14 55 W
DRAINAGE AREA: 76.9 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1963	-----PCCCC--	MANUAL	3 060	JUL 19	0	AUG 1 *	346	JUN 11	595	---	---	---
1964	--CCCCCCC---	MANUAL	13 800	JUL 22	0	MAR 1	2 880	SEP 1	4 800	---	---	---
1965	--CCCCCCCC--	MANUAL	8 170	MAY 6	0	MAR 1	2 400	MAY 6	8 750	60.0	60.0	---
1966	--CCCCCCCC--	MANUAL	7 810	JUL 2	0	MAR 1	4 910	MAY 5	11 500	72.3	66.1	9.3
1967	--CCCCCCCC--	MANUAL	10 000	JUL 7	0	MAR 1	6 480	APR 20	11 500	97.1	76.5	14.3
1968	--CCCCCCCC--	MANUAL	11 600	JUL 30	0	MAR 1	13 400	AUG 24 *	33 400	141	92.6	19.3
1969	--CCCCCCCC--	MANUAL	7 740	JUN 26	0	MAR 1	3 960	APR 12	19 600	102	94.5	14.8
1970	--CCCCCCCC--	MANUAL	6 800	APR 27	0	MAR 1	5 850	APR 28	34 200	300	129	28.1
1971	--CCCCCCCC--		13 700	JUN 21	0	MAR 1	2 660	APR 10	9 640	52.9	118	27.5
1972	--CCCCCCCC--		3 980	APR 23	0	MAR 1	646	APR 23	4 570	36.5	108	30.2
1973	--CCCCCCCC--		1 910	JUL 7	0	MAR 1	5.7	JUN 19	46.4	0.459	95.9	30.2
1974	--CCCCCCCC--		7 840	MAY 21	0	MAR 1	7 510	MAY 21	37 300 *	511	137	35.6
1975	--CCCCCCCC--		4 020	JUN 28	0	MAR 1	1 430	JUN 28	2 910	28.5	127	35.5
1976	--CCCCCCCC--		4 160	APR 5	0	MAR 1	1 530	APR 6	7 440	87.5	124	33.4
1977	--CCCCCCCC--		20 400	MAY 18 *	0	MAR 1	745	MAY 18	1 110	15.2	116	33.8

MANUAL - MANUAL SAMPLING
C - COMPLETE MONTH
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

TAYLOR RIVER NEAR THOMPSON - STATION NO. 05TG002

LOCATION: LAT 55 29 20 N LONG 098 11 10 W
DRAINAGE AREA: 883 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAY-SEP MEAN LOAD (TONNES)	SUMMARY : MAY-SEP HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAY-SEP STANDARD ERROR OF MEAN %
1971	--CCCCCCCP--		70	JUL 4	8	SEP 26	132	JUL 4	3 350	19.7	19.7	---
1972	--PPPPCCP---		62	MAY 10	13	APR 12	141	MAY 10	800	---	---	---
1973	----CCCCC---	AUTO	153	MAY 13	5	MAY 1 *	169	MAY 13	3 480	21.5	20.6	4.3
1974	----CCCCC---	AUTO	128	MAY 11	6	SEP 29	234	MAY 11	6 240	40.7	27.3	24.7
1975	-----CPP-C----	AUTO	194	MAY 5	14	SEP 7	440	MAY 26	6 080	---	---	---
1976	----CCCC-----	AUTO	224	JUN 9 *	13	AUG 31	302	JUN 16	6 810	---	---	---
1977	---PCCCCC----	AUTO	141	MAY 31	15	SEP 20	236	MAY 31	6 390	37.8	29.9	18.2
1978	----PCCCC----	AUTO	165	JUN 1	8	SEP 13	153	MAY 15	4 440	---	---	---
1979	----CCCCC----		182	MAY 28	15	SEP 10	462	MAY 28 *	12 000 *	78.6	39.7	26.7

AUTO - AUTOMATIC SAMPLING
C - COMPLETE MONTH
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

TURTLE RIVER NEAR LAURIER - STATION NO. 05LJ007

LOCATION: LAT 50 56 40 N LONG 099 31 15 W
DRAINAGE AREA: 938 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1966	----CCCCCC--	MANUAL	2 110	MAY 5	30	SEP 23	7 190	MAY 5	25 500	---	---	---
1967	--CCCCCCCC--	MANUAL	1 600	MAY 8	0	MAR 1 *	3 370	MAY 8	33 800	168	168	---
1968	--CCCCCCCC--	MANUAL	1 600	APR 24	0	MAR 1	1 380	APR 21	7 770	34.8	101	65.6
1969	--CCCCCCCC--	MANUAL	4 720	JUN 27	0	MAR 1	15 500	JUN 27	51 300	244	149	41.1
1970	--CCCCCCCC--	MANUAL	2 970	MAY 18	0	MAR 1	8 570	MAY 18	78 700	386	208	35.2
1971	--CCCCCCCC--	MANUAL	5 060	JUN 10	0	MAR 1	16 200	JUN 6	72 900	347	236	26.8
1972	--CCCCCCCC--	MANUAL	1 780	APR 27	0	MAR 1	3 630	APR 26	29 100	126	218	25.2
1973	--CCCCCCCC--	MANUAL	1 200	JUN 20	4	MAR 18	1 170	JUN 20	5 710	23.3	190	28.4
1974	---CCCCCCCC--	MANUAL	1 840	MAY 21	7	OCT 13	8 840	MAY 12	71 900	294	203	23.9
1975	--CCCCCCCC--	MANUAL	10 900	SEP 19 *	10	MAR 1	211 000	SEP 19 *	389 000 *	1 590	357	44.8
1976	--CCCCCCCC--	MANUAL	3 090	JUN 14	5	MAR 1	7 060	APR 14	89 300	364	358	40.0
1977	--CCCCCCCC--	MANUAL	6 320	JUL 12	10	MAR 1	23 000	JUL 12	48 800	199	343	37.9
1978	--CCCCCCCC--	MANUAL	3 280	APR 27	5	OCT 30	3 910	APR 27	22 900	93.4	322	37.4
1979	--CCCCCCCC--	MANUAL	5 020	MAY 17	8	MAR 1	18 800	MAY 17	79 500	324	323	34.4
1980	--CCCCCCCC--	MANUAL	1 480	APR 19	3	SEP 18	1 040	APR 19	7 730	31.5	302	34.7
1981	--CCCCCCCC--	MANUAL	1 080	MAY 23	0	MAR 1	1 220	MAY 23	7 420	31.4	284	34.9
1982	--CCCCCCCC--	MANUAL	986	APR 23	0	MAR 1	2 190	APR 23	15 500	71.2	270	34.6

MANUAL - MANUAL SAMPLING
C - COMPLETE MONTH
* - EXTREME FOR PERIOD OF RECORD

VALLEY RIVER NEAR DAUPHIN - STATION NO. 05LJ010

LOCATION: LAT 51 16 45 N LONG 100 00 39 W
DRAINAGE AREA: 2 880 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1980	--CCCCCCCC--	MANUAL	204	APR 10	2	OCT 3	693	APR 10	4 200	17.5	17.5	---
1981	--CCCCCCCC--	MANUAL	433	JUL 4	3	OCT 27	1 210	JUL 4	2 140	8.75	13.1	33.3
1982	--CCCCCCCC--	MANUAL	72	APR 18	0	MAR 1 *	80.9	APR 18	483	2.29	9.52	46.3
1983	--CCCCCCCC--	MANUAL	780	APR 25	3	OCT 26	19 600	APR 25 *	45 200 *	185	53.3	82.3
1984	--CCCCCCCC--	MANUAL	217	JUN 26	3	OCT 30	529	JUN 26	4 170	18.1	46.2	75.0
1985	--CCCCCCCC--	MANUAL	1 060	APR 2 *	3	OCT 4	1 560	APR 12	8 980	36.7	44.7	63.6
1986	--CCCCCCCCP-	MANUAL	434	MAY 6	2	OCT 15	2 390	APR 1	17 300	70.8	48.4	50.2
1987	--CCCCCCCCP-	MANUAL	625	APR 7	0	SEP 8	7 380	APR 7	16 900	74.3	51.6	41.2

MANUAL - MANUAL SAMPLING
C - COMPLETE MONTH
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

VERMILION RIVER NEAR DAUPHIN - STATION NO. 05LJ012

LOCATION: LAT 51 11 00 N LONG 100 00 45 W
DRAINAGE AREA: 674 km²
TYPE OF FLOW: REGULATED SINCE 1979
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		SUSPENDED SEDIMENT LOAD TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	SUMMARY : MAR-OCT HISTORICAL MEAN LOAD (TONNES)	SUMMARY : MAR-OCT STANDARD ERROR OF MEAN %
1970	--CCCCCCCC--	MANUAL	2 940	MAY 3	9	JUL 1	12 200	APR 26	109 000	444	444	---
1971	--CCCCCCCC--	MANUAL	2 710	APR 11	9	SEP 5	7 310	APR 11	43 800	179	312	42.5
1972	--CCCCCCCC--	MANUAL	3 570	APR 21	0	SEP 14 *	8 320	APR 24	44 200	183	269	32.6
1973	--CCCCCCCC--	MANUAL	1 020	OCT 4	0	AUG 1	924	SEP 5	3 370	15.0	205	43.2
1974	---CCCCCCP---	MANUAL	2 390	MAY 12	0	MAR 1	15 300	APR 20	167 000	---	---	---
1975	--CCCCCCCC--	MANUAL	5 660	APR 28 *	0	MAR 1	55 300	SEP 20 *	169 000	840	332	43.4
1976	--CCCCCCCC--	MANUAL	5 420	APR 10	5	MAR 1	18 900	JUN 14	176 000 *	720	397	33.9
1977	--CCCCCCCC--	MANUAL	2 410	JUL 12	10	MAR 1	1 310	JUL 12	5 460	22.3	343	36.6
1978	--CCCCCCCC--	MANUAL	1 920	APR 24	10	MAR 1	1 080	APR 24	32 000	130	317	35.3
1979	--CCCCCCCC--	MANUAL	2 670	MAY 17	0	AUG 7	11 700	MAY 17	101 000	448	331	30.1
1980	--CCCCCCCC--	MANUAL	706	APR 5	5	MAR 1	1 640	APR 5	4 150	16.9	300	31.5
1981	--CCCCCCCC--	MANUAL	1 540	JUN 24	0	AUG 23	980	MAY 30	4 840	23.1	275	32.3
1982	--CCCCCCCC--	MANUAL	1 150	APR 20	0	MAR 1	1 600	APR 18	14 000	88.5	259	32.0

MANUAL - MANUAL SAMPLING
C - COMPLETE MONTH
P - PARTIAL MONTH
* - EXTREME FOR PERIOD OF RECORD

WHITEMUD RIVER AT WESTBOURNE - STATION NO. 05LL002

LOCATION: LAT 50 08 03 N LONG 098 35 00 W
DRAINAGE AREA: 6 380 km²
TYPE OF FLOW: REGULATED SINCE 1960
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1971	---------PP--	MANUAL	42 SEP 21		41 OCT 27		--- ---		---	---	---	---
1972	---CCCCCCC--	AUTO	512 APR 17		3 APR 6	*	3 520 APR 17		34 000	---	---	---
1973	---CCCCCCCCC	AUTO	655 JUN 23		8 DEC 14		458 JUN 23		9 030	---	---	---
1974	CCCCC-PCCCC-	AUTO	1 170 APR 17		4 APR 8		12 000 APR 20		86 900	* ---	---	---
1975	CCCCCCCCCCCC	AUTO	3 090 APR 30	*	7 MAR 11		12 600 MAY 1	*	86 800	315	315	---
1976	CCCCCCCCCCCC	AUTO	280 APR 7		7 MAR 28		3 000 APR 8		31 100	123	219	43.7
1977	CCCCCCCCCCCC	AUTO	132 APR 30		5 MAR 16		85.8 JUL 15		3 530	13.8	151	58.4
1978	CCCCCCCCCCCC	AUTO	238 APR 16		8 OCT 28		833 APR 16		10 900	40.2	123	55.3
1979	CCCCCCCCCCC		276 APR 23		7 OCT 27		5 280 APR 24		54 900	221	143	39.4

AUTO - AUTOMATIC SAMPLING MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

WHITEMUD RIVER NEAR KEYES - STATION NO. 05LL005

LOCATION: LAT 50 11 15 N LONG 099 06 10 W
DRAINAGE AREA: 1 850 km²
TYPE OF FLOW: REGULATED SINCE 1960
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1971	---------PP--	MANUAL	14 SEP 21		1 OCT 28	*	--- ---		---	---	---	---
1972	---CCCCCCC--	AUTO	511 APR 16		11 OCT 9		1 280 APR 17		13 800	---	---	---
1973	---CCCCCCCCC	AUTO	163 SEP 5		4 APR 30		189 SEP 6		1 070	---	---	---
1974	CCCCPPCCCCC-	AUTO	872 APR 17		5 NOV 22		5 670 APR 17		43 000	---	---	---
1975	CCCCCCCCCCCC	AUTO	526 APR 29		6 FEB 17		1 850 APR 30		13 400	52.1	52.1	---
1976	CCCCCCCCCCCC	AUTO	363 APR 16		1 APR 3		1 190 APR 17		10 500	47.2	47.2	10.5
1977	CCCCCCCCCCCC	AUTO	254 JUL 11		8 MAR 16		211 JUL 13		1 640	6.41	33.6	41.3
1978	CCCCCCCCCCCC	AUTO	386 APR 11		10 MAY 16		829 APR 10		5 680	22.3	30.7	33.2
1979	CCCCCCCCCCC		3 080 APR 25	*	10 OCT 18		31 400 APR 25	*	166 000	* 677	160	80.9

AUTO - AUTOMATIC SAMPLING MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

WHITEMUD RIVER NEAR WOODSIDE - STATION NO. 05LL006

LOCATION: LAT 50 09 16 N LONG 098 41 51 W
DRAINAGE AREA: 6 230 km²
TYPE OF FLOW: REGULATED SINCE 1960
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1971	--------PP--	MANUAL	38 OCT 27	*	26 SEP 21	*	--- ---		---	---	---	---

MANUAL - MANUAL SAMPLING

P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

WILSON CREEK NEAR MCCREARY - STATION NO. 05LJ801

LOCATION: LAT 50 43 46 N LONG 099 33 15 W
DRAINAGE AREA: 22.8 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE: MANUAL

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1962	----PP------	MANUAL	8 050	MAY 30	100	JUN 12	---	---	---			
1963	----PCP-----	MANUAL	67 000	JUN 30 *	120	JUN 7	2 760	JUN 10	3 730	---	---	---
1964	--PCCCCCP---	MANUAL	2 810	MAY 4	6	MAY 25	397	MAY 4	1 430	---	---	---
1965	---CCCCCCC--	MANUAL	7 690	MAY 6	0	APR 1 *	1 640	APR 29	7 090	---	---	---
1966	--CCCCCCCC--	MANUAL	4 350	MAY 4	10	MAR 1	316	MAY 4	1 360			
1967	---CCCCCCC--	MANUAL	585	MAY 8	0	APR 1	70.8	MAY 7	855	5.57	5.57	---
1968	---CCCCCCC--	MANUAL	5 370	AUG 16	13	OCT 1	254	MAY 8	964	---	---	---
1969	CCCCCCCCCCCC	MANUAL	22 700	JUN 27	0	JAN 1	10 300	JUN 27	16 900	---	---	---
1970	CCCCCCCCCCCC	MANUAL	9 800	MAY 17	0	JAN 1	2 240	MAY 17	14 300	89.0	47.3	88.2
1971	CCCCCCCCCCCC		14 900	JUN 6	0	JAN 1	12 200	JUN 6	20 400	93.7	62.7	45.6
1972	CCCCCCCCCCCC		5 970	APR 25	0	JAN 1	1 150	APR 26	3 030	97.5	71.4	30.8
1973	CCCCCCCCCCCC		4 170	JUN 20	0	JAN 1	328	JUN 20	1 100	17.5	60.6	33.3
1974	CCCCCCCCCCCC		4 150	APR 26	0	JAN 1	1 360	APR 26	4 920	5.61	51.5	36.6
1975	CCCCCCCCCCCC		55 500	SEP 18	0	JAN 1	27 000	SEP 19 *	54 000 *	26.3	47.9	34.1
1976	CCCCCCCCCCCC		11 000	APR 13	0	JAN 1	1 990	APR 13	6 460	274	76.1	41.5
1977	CCCCCCCCCCCC		23 200	JUL 11	0	JAN 1	9 580	JUL 11	14 700	46.1	72.8	38.5
1978	CCCCCCCCCCCC		4 370	APR 24	0	JAN 1	522	APR 24	2 700	81.0	73.6	34.1
1979	CCCCCCCCCCCC		6 700	MAY 17	0	JAN 1	3 420	MAY 17	10 600	14.7	68.3	34.2
										49.6	66.7	32.0
1980	CCCCCCCCCCCC	MANUAL	12 100	AUG 4	0	JAN 1	1 430	AUG 21	3 920	24.2	63.4	31.4

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

WILSON RIVER NEAR DAUPHIN - STATION NO. 05LJ011

LOCATION: LAT 51 12 30 N LONG 100 10 45 W
DRAINAGE AREA: 925 km²
TYPE OF FLOW: NATURAL
TYPE OF GAUGE:

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MAR-OCT MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1980	--CCCCCCCC--	MANUAL	733	APR 6 *	0	JUN 8 *	1 140	APR 6 *	4 480	21.2	21.2	---
1981	--CCCCCCCC--	MANUAL	88	APR 1	0	AUG 7	54.1	MAY 31	411	2.59	11.9	78.3
1982	--CCCCCCCC--	MANUAL	594	APR 19	0	MAR 1	878	APR 19	4 860 *	23.7	15.9	42.1

MANUAL - MANUAL SAMPLING

C - COMPLETE MONTH * - EXTREME FOR PERIOD OF RECORD

WINNIPEG RIVER HEAD WATER SEVEN SISTERS POWER PLANT - STATION NO. 05PF057

LOCATION: LAT 50 07 10 N LONG 096 00 50 W
DRAINAGE AREA: 127 000 km²
TYPE OF FLOW: REGULATED
TYPE OF GAUGE: RECORDING

HISTORICAL SEDIMENT DATA SUMMARY

YEAR	PERIOD OF OPERATION SUMMARY (JFMAMJJASOND)	TYPE OF SAMPLING	SAMPLED CONCENTRATION MAXIMUM (MG/L)		SAMPLED CONCENTRATION MINIMUM (MG/L)		SUSPENDED SEDIMENT LOAD MAXIMUM DAILY (TONNES)		TOTAL FOR PERIOD (TONNES)	SUMMARY : MEAN LOAD (TONNES)	HISTORICAL MEAN LOAD (TONNES)	HISTORICAL STANDARD ERROR OF MEAN %
1977	---P--------	MANUAL	11	APR 25 *	6	APR 8 *	---	---	---	---	---	---

MANUAL - MANUAL SAMPLING

P - PARTIAL MONTH * - EXTREME FOR PERIOD OF RECORD

NAME	STATION NO.	PAGE
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ANTLER RIVER NEAR MELITA	05MF002	1
ASSINIBOINE RIVER AT HEADINGLEY	05MJ001	2
ASSINIBOINE RIVER NEAR HOLLAND	05MB005	8
ASSINIBOINE RIVER NEAR PORTAGE LA PRAIRIE	05MJ003	9
ASSINIBOINE RIVER NEAR ROSSENDALE	05MJ004	10
ASSINIBOINE RIVER NEAR RUSSELL	05MB001	10
BURNTWOOD RIVER ABOVE THREE POINT LAKE	05TE001	10
BURNTWOOD RIVER BELOW FIRST RAPIDS	05TG004	11
BURNTWOOD RIVER NEAR THOMPSON	05TG001	11
CHURCHILL RIVER ABOVE LEAF RAPIDS	06EB004	11
EDWARDS CREEK DRAIN BELOW JACKFISH CREEK	05LJ047	12
EDWARDS CREEK NEAR DAUPHIN	05LJ022	15
ICELANDIC RIVER NEAR RIVERTON	05BC002	16
MINK CREEK NEAR SIFTON	05LJ048	19
MOSSY RIVER BELOW OUTLET OF DAUPHIN LAKE	05LJ025	19
NELSON RIVER ABOVE BLADDER RAPIDS	05UD004	19
OCHRE RIVER AT OCHRE RIVER	05LJ005	20
ODEI RIVER NEAR THOMPSON	05TG003	20
PACKHORSE CREEK NEAR MCCREARY	05LJ034	21
PEMBINA RIVER NEAR WINDYGATES	05OB007	21
PORTAGE DIVERSION NEAR OAKLAND	05LL018	22
PORTAGE DIVERSION NEAR PORTAGE LA PRAIRIE	05LL019	22
RAT RIVER BELOW NOTIGI CONTROL STRUCTURE	05TF003	22
RED RIVER AT ELM PARK BRIDGE	05OC003	23
RED RIVER AT EMERSON	05OC001	24
RED RIVER AT SELKIRK	05QJ006	27
RED RIVER AT WINNIPEG	05QJ001	27
RED RIVER FLOODWAY NEAR LOCKPORT	05QJ014	27
RED RIVER FLOODWAY NEAR ST. NORBERT	05OC017	28
RED RIVER NEAR LOCKPORT	05QJ010	29
RED RIVER NEAR ST. NORBERT	05OC008	33
RED RIVER NEAR STE. AGATHE	05OC012	34
ROSEAU RIVER AT GARDENTON	05OD004	34
ROSEAU RIVER NEAR DOMINION CITY	05OD001	35
SASKATCHEWAN RIVER AT THE PAS	05KJ001	35
SEINE RIVER DIVERSION NEAR ST. ADOLPHE	05OE013	36
SEINE RIVER DIVERSION NEAR STE. ANNE	05OH008	36
SOURIS RIVER AT WAWANESA	05MG001	37
SOURIS RIVER NEAR COULTER	05MF016	40
SOURIS RIVER NEAR LAUDER	05MG022	43
SOURIS RIVER NEAR MINTO	05MG026	43
SOURIS RIVER NEAR WESTHOPE	05MF017	43
SOUTH BAY DIVERSION CHANNEL AT SOUTH BAY	06EC002	44
SOUTH TOBACCO CREEK NEAR MIAMI	05OF017	44
TAYLOR RIVER NEAR THOMPSON	05TG002	44
TURTLE RIVER NEAR LAURIER	05LJ007	45
VALLEY RIVER NEAR DAUPHIN	05LJ010	45
VERMILION RIVER NEAR DAUPHIN	05LJ012	45
WHITEMUD RIVER AT WESTBOURNE	05LL002	46
WHITEMUD RIVER NEAR KEYES	05LL005	46
WHITEMUD RIVER NEAR WOODSIDE	05LL006	46
WILSON CREEK NEAR MCCREARY	05LJ801	47
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WINNIPEG RIVER HEAD WATER SEVEN SISTERS POWER PLANT	05PF057	47

STATION NO.	NAME	PAGE
	MANITOBA	
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05LJ005	OCHRE RIVER AT OCHRE RIVER	20
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05LJ010	VALLEY RIVER NEAR DAUPHIN	45
05LJ011	WILSON RIVER NEAR DAUPHIN	47
05LJ012	VERMILLION RIVER NEAR DAUPHIN	45
05LJ022	EDWARDS CREEK NEAR DAUPHIN	15
05LJ025	MOSSY RIVER BELOW OUTLET OF DAUPHIN LAKE	19
05LJ034	PACKHORSE CREEK NEAR MCCREARY	21
05LJ047	EDWARDS CREEK DRAIN BELOW JACKFISH CREEK	12
05LJ048	MINK CREEK NEAR SIFTON	19
05LJ801	WILSON CREEK NEAR MCCREARY	47
05LL002	WHITEMUD RIVER AT WESTBOURNE	46
05LL005	WHITEMUD RIVER NEAR REYES	46
05LL006	WHITEMUD RIVER NEAR WOODSIDE	46
05LL018	PORTAGE DIVERSION NEAR OAKLAND	22
05LL019	PORTAGE DIVERSION NEAR PORTAGE LA PRAIRIE	22
05ME001	ASSINIBOINE RIVER NEAR RUSSELL	10
05MH005	ASSINIBOINE RIVER NEAR HOLLAND	6
05MJ001	ASSINIBOINE RIVER AT HEADINGLEY	2
05MJ003	ASSINIBOINE RIVER NEAR PORTAGE LA PRAIRIE	9
05MJ005	ASSINIBOINE RIVER NEAR ROSSENDALE	10
05NF002	ANTLER RIVER NEAR MELITA	1
05NF012	SOURIS RIVER NEAR WESTHOPE	43
05NF016	SOURIS RIVER NEAR COULTER	40
05NG001	SOURIS RIVER AT WAWANESA	37
05NG023	SOURIS RIVER NEAR LAUDER	43
05NG026	SOURIS RIVER NEAR MINTO	43
05OB007	PEMBINA RIVER NEAR WINDYGATES	21
05OC001	RED RIVER AT EMERSON	24
05OC003	RED RIVER AT ELM PARK BRIDGE	23
05OC008	RED RIVER NEAR ST. NORBERT	33
05OC012	RED RIVER NEAR STE. AGATHE	24
05OC017	RED RIVER FLOODWAY NEAR ST. NORBERT	28
05OD001	ROSEAU RIVER NEAR DOMINION CITY	35
05OD004	ROSEAU RIVER AT GARDENTON	34
05OE013	SEINE RIVER DIVERSION NEAR ST. ADOLPHE	36
05OF017	SOUTH TOBACCO CREEK NEAR MIAMI	44
05OH009	SEINE RIVER DIVERSION NEAR STE. ANNE	36
05OJ001	RED RIVER AT WINNIPEG	27
05OJ005	RED RIVER AT SELKIRK	27
05OJ010	RED RIVER NEAR LOCKPORT	29
05OJ014	RED RIVER FLOODWAY NEAR LOCKPORT	27
05PF057	WINNIPEG RIVER HEAD WATER SEVEN SISTERS POWER PLANT	47
05SC002	ICELANDIC RIVER NEAR RIVERTON	16
05TE001	BURNTWOOD RIVER ABOVE THREE POINT LAKE	10
05TF003	PAT RIVER BELOW NOTIGI CONTROL STRUCTURE	22
05TG001	BURNTWOOD RIVER NEAR THOMPSON	11
05TG002	TAYLOR RIVER NEAR THOMPSON	44
05TG003	ODEI RIVER NEAR THOMPSON	20
05TG004	BURNTWOOD RIVER BELOW FIRST RAPIDS	11
05UD004	NELSON RIVER ABOVE BLADDER RAPIDS	19
06EB004	CHURCHILL RIVER ABOVE LEAF RAPIDS	11
06EC002	SOUTH BAY DIVERSION CHANNEL AT SOUTH BAY	44